COMMUNITY-ACADEMIC PARTNERSHIPS: A MIXED METHODS EXPLORATION OF COLLABORATION, NETWORK STRUCTURE, AND OUTCOMES FOR HEALTH EQUITY

By

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ABSTRACT

COMMUNITY-ACADEMIC PARTNERSHIPS: A MIXED METHODS EXPLORATION OF COLLABORATION, NETWORK STRUCTURE, AND OUTCOMES FOR HEALTH EQUITY

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Community-based organizations (CBOs) play a critical role in improving conditions within marginalized communities for health equity. However, stronger organizational capacity within CBOs is needed to develop *sustainable* public health equity efforts. One strategy that can support sustainable health equity efforts from CBOs in marginalized communities is the use of community-academic partnerships (CAPs)—partnerships extending beyond academic boundaries to translational research in real-world settings. This dissertation project examines the CAP structure of the Flint Center for Health Equity Solutions (FCHES), which is a collaborative, transdisciplinary research center focused on improving public health equity for Flint, Michigan. Using a longitudinal, sequential mixed methods design, the study sought to examine facilitating and hindering factors to CAP collaborations, elicit partner perspectives about and experiences with the collaboration, and compare changes in the overall network structure over time (1 year apart). While unintended, the study had the unique opportunity to also explore how a fluctuating environment related to the COVID-19 pandemic influenced partnerships (e.g., ties) and network outcomes over time. Exploratory social network analysis (SNA) examined the overall network structure, partner connectivity embedded in the network, position of partners, and quality of relationships. Semi-structured interviews were used to expand on the quantitative data and contextualize responses, including obtaining rich details on: (a) perspectives on the collaboration process; (b) barriers and facilitators; (c) motivations for joining and for continuing to participate;

(d) goals; and (e) recommendations for improvement from the perspectives of partners and leaders. Understanding community and academic partner's perspectives on collaboration efforts and dynamics of their relationships is important to move health equity forward. The current dissertation project contributes to the literature on CAP perspectives by identifying facilitating and hindering factors to CAPs as well as examining how these change over time; identifying network outcomes, their changes over time, and how they vary by partner type, and motivational factors to participate and continue to participate with the CAP over time. The broader impact of this research builds on systems-level, ecological perspectives grounded in community psychology, emphasizing how networks of CAPs in public health within larger systems of historically marginalized communities can work collaboratively to better understand and resolve health disparities. A closer examination of motivating factors, as well as strengths and challenges that lead to collaboration outcomes can help develop strategies to strengthen partnership dynamics. Further, the study examined changes across two different time-points, allowing for a closer examination on how external influences from fluctuating environments (e.g., community contexts; COVID-19) may change a partnership over time. Results will be useful for stakeholders involved in CAPs interested in developing and improving collaborative approaches to public health that center community-based priorities. Findings ultimately highlight how community-based efforts are dynamic processes, intertwined with contexts related to community, resources, interpersonal connections, power, and equity.

Dedicated to my sister, Thalia Karina Bustos, thank you for watching over me and keeping the lowest points my strongest accomplishments.

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CHAPTER 1: INTRODUCTION

Health disparities, defined as preventable differences in health related outcomes or opportunities to treatment, are pervasive within marginalized communities and racial minorities and across health indicators (Braveman et al., 2011; Griffith et al., 2010; Williams, 2012). These individual level disparities have been linked to systems-level health care disparities, which refer to differences between groups in access to or use of appropriate, quality care (Dehlendorf et al., 2010). In an effort to reduce health inequities at both the individual and systemic level, many health initiatives and policies have been written that focus on increasing opportunities for marginalized populations by utilizing health equity frameworks (Braveman et al., 2011; Cohen et al., 2013). A health equity framework is critical to reduce health disparities and to improve conditions for communities in need (Braveman et al., 2011; Cohen et al., 2013). Accordingly, these health equity efforts have focused on intervening upon the broader community wherein health disparities are observed. Such efforts encourage the use of strategies that involve community stakeholders, including community-based organizations to identify needs and opportunities for interventions on community systems (Gilbert et al., 2011).

Community-based organizations (CBOs) can play a critical role in improving conditions within communities to improve health equity (Smith et al., 2005). For example, CBOs are often perceived as critical by marginalized populations, and have longstanding positive impact on mobilizing needed resources to minimize barriers in availability and access to health-related resources (Griffith et al., 2010; Smith et al., 2005; Wilson et al., 2012). However, stronger organizational capacity of CBOs is needed to develop *sustainable* public health equity efforts (Cohen et al., 2013; Griffith et al., 2010). One potential strategy that can better support sustainable health equity efforts from CBOs in marginalized communities is the use of

community academic partnerships (CAPs). CAPs refer to partnerships between academic researchers and community-based practitioners, where control is shared to achieve a common objective relevant to the needs of communities with community input integrated throughout the research process (Drahota et al., 2016). CAPs can be used as a strategy to support and enhance the capacity of existing community-based initiatives and programs to meet community health needs more effectively (Griffith et al., 2010).

Public health needs call for greater community participation and control in processes that define community problems and design and implement interventions that are both meaningful and feasible within the community (Israel et al., 1998; Wallerstein & Duran, 2010). Collaborative efforts, such as those reflected in CAPs, among the dynamic and interactive components of a community setting are necessary to create sustainable community interventions and impactful research (Trickett & Beehler, 2013).Yet, understanding the use of CAPs, along with mechanisms of change determining successful outcomes, remains unclear.

Oftentimes, little attention is paid to the interactive relationships in CAPs, which can be a proxy to a network's effectiveness (Behringer et al., 2018; Bunger, Doogan et al., 2014; Honeycutt & Strong, 2012; Ortega et al., 2018). For instance, factors, such as motivation to participate, perception of success, and reasons for continuing to collaborate, can strongly predict the long-term effectiveness of the network of CAPs (Carney et al., 2011; Valente et al., 2008). Yet, the perspectives of community partners participating in CAPs remains understudied in the literature. Moreover, other CAP characteristics and contextual factors can also influence relationship dynamics within a partnership (Suarez-Balcazar et al., 2005). Thus, assessing contextual factors and eliciting details on community partner perspectives are needed to identify strategies that are effective and to understand factors that facilitate or hinder collaborative efforts

in real world settings (Behringer et al., 2018; Suarez-Balcazar et al., 2005). The proposed mixed methods project (QUAN → QUAL) across two study time points aims to utilize quantitative social network analysis (SNA) methodology to collect details on collaborative ties that exist within a newly formed CAP. This data informed the degree of activities, level of trust shared, and frequency of interactions between partners within the CAP. Moreover, this proposed study utilized qualitative data collected through semi-structured interviews to contextualize the quantitative data, allowing for a broader exploration on how community partner perspectives relate to the frequency of collaboration and number of network ties with other agencies in the CAP. This longitudinal mixed methods research design was used to create a set of recommendations to improve collaborative relationships and to contribute a longitudinal observation of CAP processes and impact on health equity efforts.

Literature Review

Overall, this review will link literature on public health equity efforts and community academic partnerships. The review focuses on the current state of health disparities for minority populations in the United States (U.S.) with an overview on how public health is viewed as a set of complex systems that require systems level approaches to better understand existing health disparities. Then, the review describes literature on existing public health equity efforts in collaboration with community-based organizations, introduces the role of community-academic partnerships in health equity and how these strategies have been applied in public health, identifies gaps in the literature, and then proposes a system science methodology (social network analysis) to complement CAP literature.

Racial Health Disparities in the U.S.

In the U.S., racial and ethnic minority populations have higher rates of nearly every health-related issue when compared to their White counterparts (Williams, 2012). Racial health disparities are pervasive in all phases of disease progression, including the onset, severity, advancement and outcome (Williams, 2012). The conceptualization of racial health disparities is best captured as,

> A difference in which disadvantaged social groups such as the poor, racial/ethnic minorities, women and other groups who have persistently experienced social disadvantage or discrimination systematically experience worse health or greater health risks than more advantaged social groups. (Braveman et al., 2011, p. 169)

While these disparities may exist between other majority-minority groups, such as individuals with gender and intersectional identities (e.g., multiple minoritized identities) and cis-gendered individuals or individuals with majority identities, the current project will focus on racial health disparities, in particular.

Health Equity

In an effort to reduce health inequities, many national public health initiatives have shifted from the use of a deficit-based approach in racial health disparities to increasing opportunities for *health equity* among marginalized populations (Braveman et al., 2011). In the field of public health and policy, efforts have shifted from improving population health to addressing the widened health disparities between ethnic minority and majority groups (Graham, 2004). Health equity refer to efforts concerned with creating equal opportunities for health and minimizing health differentials across indicators (Whitehead, 1992). In addition, health equity efforts are concerned with the pursuit of social justice to address longstanding racial inequities at

a systemic level in health care and access, as well as a basic human rights principle (Braveman & Gruskin, 2003; Cohen et al., 2013; Peter, 2001). This approach treats the pursuit of health equity as an interlinked movement in pursuit of social justice (Peter, 2001). Thus, health equity efforts place emphasis on the broader social processes *underlying* health inequities, such as lack of resources, lack of culturally responsive services or treatment, and issues related to organizational infrastructures (Peter, 2001). Changing the broader community in which health disparities function then begins with cultivating the community's capacity to address these needs (Gilbert et al., 2011).

Public Health as Complex Systems

Public health inequities, communities, and service systems all function together as complex systems, defined as a system "whose properties are not fully explained by an understanding of its component parts" (Gallagher & Appenzeller, 1999, p. 79). Complex systems refer to interactive systems nested within larger systems, with an emphasis on how each component and context of the system cannot be fully understood without the other (Leischow & Milstein, 2006). In order to improve public health and broaden understanding of its complexities, there is a need to utilize approaches that can incorporate contexts, societal structures, and the function and interplay of these factors rather than isolate or control them (Leischow et al., 2008; Luke & Stamatakis, 2012).

Given this, current trends in public health research have moved past traditional research to practice-based models, with a growing emphasis on interactive system frameworks, systems-level thinking, and multi-dimensional approaches (Brownson et al., 2012; Leischow et al., 2008; Mabry et al., 2013). In light of these efforts, systems-level thinking approaches are at the forefront in understanding the complexity of public health concerns rather than attempting to

minimize such complexities (Brownson et al., 2012; Foster-Fishman et al., 2007; Trickett & Beehler, 2013). *Systems thinking* refers to a multi-level, multi-actor process of understanding how things influence one another within a whole (Brownson et al., 2012; Butterfoss et al., 2008). A systems-level thinking approach requires one to understand the fundamental parts to a system, while also understanding the system's role in causation (Foster-Fishman et al., 2007).

Strategies that align with these approaches consider the integration of community perspective and processes into designing interventions that can reduce health inequities and increase health equity. This process can then be facilitated by engaging CBOs in these health efforts—a strategic approach for developing more effective interventions and policies tailored to the needs of marginalized communities (Tugwell et al., 2006).

Community-Based Organizations and Public Health

Community-based organizations (CBOs) can function as a service sector to facilitate health equity through the implementation of community interventions. CBOs refer to:

> "formal, legal structures established by, or together with, community residents in order to advocate for secure, increase access to, or provide health and health-related social support to a community" (Smith et al., 2005, p. 5).

This definition of CBOs encompasses community-based health organizations, health or social service organizations, mental health organizations, faith-based organizations, or other health care networks (Ross, 2017; Willem & Gemmel, 2013; Wilson et al., 2012).

Prior and current research have emphasized the role of CBOs in improving social conditions for greater health equity in marginalized communities. Historically, the development of CBOs in public health reflected a political response to the failure of policy and treatment among marginalized, low income communities (Griffith et al., 2010; Smith et al., 2005). That

being said, CBOs are well-positioned to serve communities impactfully, given their knowledge, understanding, and reciprocated relationships with local communities and populations served (Smith et al., 2005; Wilson et al., 2012). For example, CBOs have helped mobilize much needed resources to minimize healthcare access barriers within underserved communities (Chaskin, 2001; Smith et al., 2005). CBOs also work to enhance community capacity to meet public health concerns at the community level by effectively responding to the larger system in which underserved communities function (Chaskin, 2001; Jung, 2012; Smith et al., 2005; Wilson et al., 2010).

However, stronger organizational capacity of CBOs is needed to develop *sustainable* public health equity efforts (Cohen et al., 2013; Griffith et al., 2010). To date, **few empirical studies have provided strategies or guidelines of best practices to strengthen CBO efforts in public health** (Gainforth et al., 2015; Lasker et al., 2001; Pellecchia et al., 2018). Thus, there continues to be a need to better support sustainable health equity efforts from CBOs and a need to identify strategies to inform the implementation of public health practices, particularly in marginalized communities (Cohen et al., 2013; Gainforth et al., 2015; Wilson et al., 2010). A systems-level perspective to CBOs can help address issues related to capacity by highlighting how existing networks and fostering new collaborations can promote systems change (Altpeter et al., 2014).

Community-Academic Partnerships

Organizations, communities and partnerships involved in public health efforts must not be seen as static, but as fluid and cumulative efforts that are dynamic by nature (Behringer et al., 2018). A systems-level approach to CBOs emphasizes these dynamic relationships referred to as interorganizational collaboration (Leischow & Milstein, 2006). *Interorganizational*

collaboration refer to integrated efforts across CBOs, or other sectors, that fosters coordination, such as sharing resources, staff, or rewards toward a common intended goal among multiple agencies, researchers, service sectors, and policymakers (Berthod et al., 2017; Hardy et al., 2003; Provan et al., 1996; Seaton et al., 2018; Willem & Gemmel, 2013). In public health, interorganizational collaborations are often used to mobilize communities to successfully tackle the complexities of public health challenges through systems change efforts (Litt et al., 2015; Miller et al., 2013). Indeed, the ability to meet public health challenges faced today will require an emphasis on systems thinking and the integration of partnerships with CBOs and the populations served.

The current study is prioritizing a systems approach to public health challenges utilizing CAPs—interorganizational collaboratives extending beyond academic boundaries to translational research in real-world settings (Felege et al., 2016; Leischow & Milstein, 2006). CAPs can be considered an exemplar model of an interorganizational collaborative, whereby academic and community partners are working together across respective organizational and regional boundaries toward an intended shared goal.

CAPs are considered an effective strategy that can sustain community partnerships and strengthen the impact from community-based efforts on public health needs (Behringer et al., 2018; Beidas et al., 2016; Carney et al., 2011; Drahota et al., 2016; Eisinger & Senturia, 2001; Eriksson et al., 2014; Pellecchia et al., 2018). CAPs represent practical approaches to connecting community members and agencies to the academic community with more informed efforts to enhance capacity and high quality implementation of evidence-based practices (Brookman-Frazee et al., 2012; Drahota et al., 2016; Garland & Brookman-Frazee, 2015; Noel et al., 2019; Spoth et al., 2007). CAPs involve community-partnered research that includes community

stakeholders into the decision-making processes of interventions, programs, practices and other health related efforts; likewise, academic stakeholders are integrated into the decision-making processes of CBOs' real-world application of said practices, interventions or treatments into the community (Pellecchia et al., 2018).

For the current study, CAPs was conceptualized with the following definition for more inclusivity of partnerships grounded in community-based efforts:

> Community-academic partnerships (CAPs) are characterized by equitable control, a cause(s) that is primarily relevant to the community of interest, and specific aims to achieve a goal(s), and involves community members (representatives or agencies) that have knowledge of the cause, as well as academic researchers. (Drahota et al., 2016, p. 192)

Determinants to CAP Collaboration

Benefits of Collaboration

Generally, when more organizations are collaboratively involved in promoting and delivering health services, the capacity of a community to attend to public health concerns can greatly improve, as it relates to service access, health outcomes, and awareness of public health challenges (Andersson & Ose, 2007; Cooper et al., 2016; Provan et al., 2004, 2005). CAP activities directly related to pooling resources and enhancing communication and coordination among competing agencies can create more efficient service delivery systems and allow for further assessments of system-level change efforts (Bunger, Collins-Camargo, et al., 2014; Luque et al., 2011; Radcliff et al., 2018). Communities using CAPs related to public health efforts can potentially gain benefits that fall into seven categories: (1) identifying needs for public health education; (2) advocacy for resources to improve public health; (3) problem

solving to help community agencies; (4) advocacy for policy change; (5) public health program development, implementation, or evaluation; (6) community needs assessment and planning; or (7) documenting the extent of a public health issue to serve as a catalyst for community action in public health (Carney et al., 2011). However, many of these outcomes are impacted by factors that facilitate or hinder the collaboration process.

Facilitating Factors to CAP Collaboration

Successful collaboration requires clear communication, planning throughout implementation phases, sharing beyond resources to include physical space, values, and community, stakeholder engagement, partnership synergy, and sharing of decision-making responsibility (Ansell & Gash, 2007; Butterfoss et al., 2008; Chaskin, 2001; Hamilton et al., 2014; Henderson et al., 2017; Lasker et al., 2001; Norris et al., 2017; Turrini et al., 2010). The values of an organization are also critical to meeting health equity priorities and goals (Cohen et al., 2013). For instance, if collaborators share the same vision and values of equity and social justice, then their capacity to take action for health equity efforts is greatly strengthened (Cohen et al., 2013; Gilbert et al., 2011). Other factors that have facilitated successful collaborative efforts include moderate to high levels of trust, degree of formalization, resolution of conflict, reputation of organizations, perceived influence, shared incentives (such as resources or information), having a network administrative organization that promotes stability of relationships, effective communication strategies across sectors, and interprofessional training activities (Cooper et al., 2016; Eisinger & Senturia, 2001; Galaskiewicz et al., 2006; Hamilton et al., 2014; Hardy et al., 2003; Palinkas et al., 2009; Prince & Austin, 2005; Provan et al., 2009; Ramos-Vidal, 2018).

Of note, trust is critical to the success of CAPs (Schulz et al., 2003; Trotter et al., 2015). This is particularly true for disadvantaged communities that have a longer history of marginalization or harm from exploitative research; such circumstances create mistrust of academic institutions (Abdulrahim et al., 2010; Benoit et al., 2005; Brown et al., 2005). The same is also true for community members who do not trust other community partners with controversial social actions. This highlights the importance of adapting structural conditions within a partnership to create an environment that minimizes conflict and fosters authenticity and vulnerability (Abdulrahim et al., 2010; Castaldo et al., 2010). Research specific to CAPs in public health has provided several strategies that can build trust through team building efforts, such as having committed and active leadership from all partner agencies; building on knowledge experiences and working relationships gained from prior or existing collaborations, including partners with a history of engagement in their communities who are well respected (this is particularly relevant for the Flint community), and utilizing excellent project management to organize meetings, events, communicate updates and follow through on requests or actions (Brown et al., 2005; Gilbert et al., 2011; Green et al., 2001; Lantz et al., 2001; Suarez-Balcazar et al., 2005).

Additionally, engaging populations of interest is crucial for inclusive participation in CAPs, along with outcomes that mutually benefit partnering agencies, community members, and the research field overall (Altpeter et al., 2014; Eisinger & Senturia, 2001). Effective strategies to engage target populations include sharing power with community members in CAPs throughout decision-making processes of the research project (Ansell & Gash, 2007; Beidas et al., 2016; Brookman-Frazee et al., 2016; Brown et al., 2005) and approaching community partnerships with a strengths based approach rather than problematizing community issues (Green et al.,

2001; Suarez-Balcazar et al., 2005). These strategies include a wider range of activities, such as integrating community members' input into survey or intervention design or collaboratively interpreting findings in sense-making sessions.

Integrating Diverse Stakeholders. For broader impact of CAPs, there needs to be diversity of agencies and stakeholders, such as policymakers, program directors, key leaders and community members functioning within health systems, actively involved throughout the partnership process in the ultimate outcomes of CAP (Bright et al., 2019; Lasker et al., 2003). The integration of multiple, diverse and relevant stakeholders is critical to fostering trust in CAPs (Eriksson et al., 2014; Green et al., 2001; Suarez-Balcazar et al., 2005). The diversity of stakeholders allows for open and varied discussions to inform next actions steps and can cultivate a myriad of knowledge, skills, resources to create new ideas or strategies collectively (Eisinger & Senturia, 2001; Eriksson et al., 2014; Green et al., 2001; Lasker et al., 2003). Diverse stakeholders also helps promote more public awareness for social action, optimize participation, involvement, and benefits of the CAP process, and prevent challenges to power distributions in leadership and management (Green et al., 2001; Lasker et al., 2003; Litt et al., 2015).

Hindering Factors to CAP Collaboration

Barriers to successful collaboration can impede the potential benefits to communities, academics, and policymakers. Indeed, collaboration is a complex process, involving shared *and* competing interests and agendas of several organizations (Aarons et al., 2014; Chaskin, 2001). Moreover, collaboration is typically a long-term process, requiring organizations to stay persistent in carrying out activities in order to achieve intended outcomes (Aarons et al., 2014; Andersson & Ose, 2007; Chaskin, 2001; Coviello, 2005; Lantz et al., 2001). Given this,

challenges to collaboration are often related to boundaries between organizations and their respective autonomy from other organizations; lack of coordination; role ambiguity; ineffective communication strategies; lack of resources; conflicting organizational cultures, strategies, or approaches, competing priorities across levels of leadership, and other types of power imbalances (Aarons et al., 2014; Acri et al., 2014; Bunger, Collins-Camargo, et al., 2014; Cooper et al., 2016; Ehrhart et al., 2014; Lantz et al., 2001; Lasker et al., 2001; Monge & Contractor, 2001; Pavkov et al., 2012; Provan et al., 2004; Trotter et al., 2015). Other frustrations in public health CAPs relate to the amount of time it takes to see concrete outcomes and positive changes in their communities (Lantz et al., 2001) and with staff turnover (Brown et al., 2005).

Research specific to CAPs have indicated barriers related to tensions in competing interests and finding a proper balance between community interests and research needs (Lantz et al., 2001; Lindamer et al., 2008). For instance, the Detroit Community-Academic University Research Center found that many CBOs and academic partners were primarily interested in research projects and in extending generalizability; but both members wanted to maintain special consideration to research participants (e.g., community members). Of note, this is a unique barrier specific to CAPs that interact with the ongoing pressures embedded in academia and CBO's funding agencies to produce research that rewards their efforts, while also prioritizing values of community at the forefront. This factor is particularly relevant when working with historically marginalized communities.

Governance

Other factors that potentially impact outcomes of CAPs relate to governance. Governance refers to the decision-making body directing a particular agency and is considered a key factor to partnership effectiveness (Milward et al., 2010; Raeymaeckers, 2013; Willem & Gemmel, 2013).

For instance, some agencies may have to work with competing demands from multiple sources outside of their authority; while others with more authority are more actively involved because they can allot resources or time to meet the needs of the partnership (Lasker et al., 2001; Mayer et al., 2017; Provan & Kenis, 2007). This can lead to varied outcomes based on the partnering agency's decision-making power. Therefore, governance structures that establish a shared understanding to inform action steps to address public health concerns and sustainment is required for successful partnerships (Ansell & Gash, 2007; Green et al., 2001; Suarez-Balcazar et al., 2005).

Relatedly, how partnerships are initiated can also impact its success. Different mechanisms for initiation of CAPs have indicated mixed results on how governance impacts collaboration outcomes and sustainability, with both community partner and academic partners initiating efforts equally (Drahota et al., 2016; Provan & Kenis, 2007). In some cases, a funder or grant requirement might pair a community partner with an academic representative. Such mechanisms can threaten funding needed for sustainability beyond the scope of work (Gilbert et al., 2011). That is, partnerships initiated through a grant may risk losing its continuation after funding has been removed (Garland & Brookman-Frazee, 2015). In other cases, community members would likely not seek out academic researchers to improve health services, but would rather focus on other similar agencies, which then leads to lower impact (Brookman-Frazee et al., 2016). Given these outcomes from different forms of initiation, it becomes increasingly important for community and academic partners to engage in ongoing discussions on goals and resources throughout the CAP development (Garland & Brookman-Frazee, 2015; Riemer et al., 2012). Some studies have further suggested the need for more community involvement at earlier phases of the CAP's initiation (Suarez-Balcazar et al., 2005).

Other External Factors

Additionally, other external factors related to fluctuating environments surrounding CAPs can also impact ongoing collaborations and CAP outcomes. There is strong evidence that indicates how fluctuating environments can impact network dynamics in partnerships over time (Bunger, Doogan, et al., 2014; Madhavan et al., 1998; Park & Rethemeyer, 2014; Tatarynowicz et al., 2016). For example, dynamic funding environments can either weaken or strengthen existing ties in a partnership. Fiscal scarcity, in particular, can greatly limit the expansion of programs by fragmenting ties within partnership networks due to conflict or competition for resources (Bunger, Doogan, et al., 2014; Park & Rethemeyer, 2014), curtailing coordination of service systems. In contrast, stages of munificence can stimulate collaboration but changes in network patterns can vary by partnership characteristics, such as level of trust or prior history of collaboration (Bunger, Doogan, et al., 2014; Park & Rethemeyer, 2014). Thus, moments of uncertainty in fluctuating environments may present opportunities for partners to restructure their partnership infrastructure to meet demands or overcome challenges strategically (Ahuja et al., 2012; Bunger, Doogan, et al., 2014; Isett & Provan, 2005; Madhavan et al., 1998).

Overview of CAPs in Public Health

There is extensive literature supporting the use of CAPs with diverse stakeholder groups and across various contexts, including public health, education, health care services, and policy. As a matter of fact, public health has had a rich history of using CAPs as a strategy to minimize risks from substance abuse, mental health teen pregnancy, HIV, cancer prevention, and other behavioral and physical health conditions among a wide range of populations (Alexander et al., 2001; Brown et al., 2005; Eisinger & Senturia, 2001; Garland & Brookman-Frazee, 2015). In particular, CAPs are instrumental to addressing the complex, systemic health problems in urban

contexts, low-income communities, communities with marginalized populations, or other disadvantaged settings, such as rural areas (Abdulrahim et al., 2010; Gilbert et al., 2011; Meade & Calvo, 2001).

CAPs in Health Care Services

An extensive amount of literature supports how CAPs can increase the cultural relevance of health interventions for marginalized populations and can help create components that are tailored to the community's needs (Brookman-Frazee et al., 2016; Carney et al., 2011; Drahota et al., 2016; Gilbert et al., 2011; Griffith et al., 2010; Lantz et al., 2001; Nicolaidis et al., 2011). Given this, CAPs have been frequently utilized to improve health care services by addressing community concerns regarding health service engagement and use in marginalized communities. For instance, CAPs comprised of health service and disability researchers designed protocols, instruments, recruitment strategies, data analyses, and dissemination strategies in collaboration with the autism community (Nicolaidis et al., 2011). With CAPs, efforts in designing health care services prioritized the needs of adults with autism who were self-advocates in their community. Materials and strategies for communicating research findings were also tailored to the relevance and preference of adults with autism in Portland, resulting in improved health care service delivery. Other CAPs have been used to create screening and assessment tools to survey community health among African American communities in Flint, develop culturally responsive evidence-based treatments for marginalized communities, improve mental health interventions for older persons with schizophrenia, improve utilization of evidence-based practices for ASD communities, and generally, inform more relevant and responsive mental health interventions for marginalized populations (Aisenberg et al., 2012; Brookman-Frazee et al., 2016; Griffith et al.,

2010; Lindamer et al., 2008; Meade & Calvo, 2001). Overall, CAPs have been shown to enhance the ecological specificity and external validity for broader reach and community impact.

Other public health efforts have utilized CAPs to build trauma-informed behavioral health systems for children and families, such as the Philadelphia Alliance for Child Trauma Services (Beidas et al., 2016). Such efforts required the coordination of a comprehensive network of providers located across the city to increase community capacity to meet public health needs. Similar projects have integrated CAPs to specifically build the community capacity of CBOs in order to use evidence based practices for HIV prevention services grounded in research and to then evaluate their own implementation of said practices (Brown et al., 2005; Harper et al., 2004; McKay et al., 2012). Overall, CAPs have demonstrated strong evidence to support their use in improving the design of health care services, the quality of implementing evidence-based practices, and the general utilization of health care practices by providers and families (Brookman-Frazee et al., 2016). This, in turn, serves the potential to promote sustainability of public health interventions within community-based settings generally, and for marginalized communities, in particular.

CAPs in Health Care Policy

Efforts to use CAPs for health services extend to health policy. That is, CAPs have been utilized to tailor decision-making processes for health care policies and to engage policymakers at the local, state and national levels for broader, more responsive impact (Baquet et al., 2013; Lasker et al., 2003; Roby et al., 2014). CAPs in the context of health care policy have been associated with outcomes related to community empowerment, an increased sense of trust between community members and research, willingness to engage in research projects, leveraged funds, and policies to support and sustain relevant health and social interventions (Baquet et al.,

2013). CAPs can also promote the use of evidence in policy-making decisions by allowing first-hand input from communities and researchers (Roby et al., 2014).

The inclusion of policymakers and government agencies in community partnerships is needed for broader impact on community health (Lasker et al., 2003). The role of policy-makers within a CAP is particularly important for buy-in and involvement in the implementation of public health practices, along with sharing knowledge of health promotion (Beidas et al., 2016; Eriksson et al., 2014; Leischow et al., 2008). Partnering with government agencies also increases the likelihood of more sustainable stream of resources, thereby potentially improving the quality of care by sustaining partnerships.

Gaps in the Literature

Community stakeholder participation in CAPs is important to understand in order to create and design strategies that are relevant, useful and responsive to the needs of a given community (Benoit et al., 2005). Yet, much remains to be known about community stakeholder participation in CAPs overall. For instance, while CAPs have demonstrated a significant impact on improving health efforts for communities in need, there is limited understanding on the interactive relationships between community partners with other community partners (Behringer et al., 2018; Ortega et al., 2018). There is also limited research on CAPs specifically exploring the motivations and perceptions of the partnership process from the perspective of participating community members or agencies (Meza et al., 2016; Ortega et al., 2018). Thus, there is a need to better understand and document how community partners benefit from CAPs to inform strategies to sustain those partnerships. To fill this gap and enhance the literature related to community partner perceptions and motivations, the current study proposes to explore community partners' motivation to participate, perception of benefits, and overall experience with CAP collaborations.

Motivation to Participate in CAPs

Understanding motivation to participate in CAPs is important to ensure efficient and successful strategies for collaboration leading to health equity (Carney et al., 2011). Very few studies have examined initial motivating factors of community partners or factors that would sustain their motivation to participate in CAPs over time (Kamuya et al., 2013; Walsh et al., 2014). The existing literature indicates that many community partners decide to participate in CAPs based on their perceived value of others' contribution; perceived value of one's own contributions; and benefits that would likely occur (Behringer et al., 2018). More broadly, partnerships can also be motivated for the purpose of knowledge transfer, with community partners learning a new skill to adapt into their own settings (Garland & Brookman-Frazee, 2015; Ortega et al., 2018). Other findings have indicated how social support outside of the CAP and some extent of intrinsic drive (e.g., shared values or mission) is important to sustain participation among community partners over time (McKay et al., 2012). Studies focused on historically marginalized populations have indicated that community members are typically driven to be a voice for their community by contributing their knowledge and experiences, influence decisions relevant to their community, and ultimately help address community health (Kamuya et al., 2013; McKay et al., 2012; Nicolaidis et al., 2011; Ortega et al., 2018). In other instances, community members may have participated in CAPs with unmet expectations (Abdulrahim et al., 2010).

To the researcher's best knowledge, there is only one assessment tool that focuses on partners' decision to participate in a CAP, exploring the motivating factors from community stakeholders in CAPs. The 15-item *Decision to Participate Questionnaire* (DPQ) is a survey that builds on facilitating and hindering factors identified from a systematic review on CAPs across

various disciplines (Drahota et al., 2016; Meza et al., 2016). While the survey does not have established psychometric properties (Meza et al., 2016), the current study adapted this measure to add to the literature on initial and continuing motivating factors from the perspective of community partners in CAPs.

Benefits and Challenges of Participation

Prior studies have indicated a multitude of benefits perceived from community members participating in CAPs related to: increasing capacity in expertise of using evidence-based services; promoting the ability to address health issues or other issues related to the partnership process; promoting the ability to impact public policy; fostering trusting relationships with other groups who share similar values in health equity; garnering knowledge about health related issues, programs, or issues narrated from people in the community; having the opportunity to make an impact in the community; achieving organizational goals; acquiring financial support through collaboration; enhancing access to populations of interest; increasing the ability to create more impact by working collaboratively with other agencies (Butterfoss, 2006; Kamuya et al., 2013; Lasker et al., 2001; Nowell & Foster-Fishman, 2011; Ortega et al., 2018). Yet, very few studies have considered the quality of community participation from the perspective of community members (Griffith et al., 2010). For instance, one study found that community members were not sure if their efforts were efficient since there were no consistency or informed instruction on roles and responsibilities (Ortega et al., 2018). Thus, the quality of participation may have varied significantly across community members, potentially leading to insufficient influence in partnership activities or insufficient acknowledgement of one's contributions to CAP outcomes (McKay et al., 2012).

Community partners' perception of benefits and/or drawbacks to the CAP can also impact their decision to participate in the partnership process (Butterfoss et al., 1996; Lasker et al., 2001; McKay et al., 2012; Ortega et al., 2018). That is, members who are more active partners tend to perceive significantly more gains than members who are less active in the partnership effort (McKay et al., 2012; Ortega et al., 2018). Similar to the literature on the barriers and facilitators to collaboration, community members oftentimes perceive the CAP process as challenging due to limited communication, lack of awareness of the infrastructure or other formal mechanisms, and limited opportunities for involvement in other aspects of projects because of time constraints or personal obligations (Griffith et al., 2010; Ortega et al., 2018). Understanding how community partners perceive the CAP process is important to consider for reconciliation of conflicts (Green et al., 2001). Yet, very little studies have focused on this aspect of the CAP process or considered its impact on the formation of the partnership over time.

Strategies that capture community partners' perceptions of CAPs have utilized the Give-Get Grid Model. The Give-Get Grid Model collects community and academic partners' expected benefits and contributions (Behringer et al., 2018; Southerland et al., 2013). That is, both partners are asked what can be given and what can be received in return from their own agency and from the other partner. Typically, focus groups, interviews, or other discussion formats are used to elicit this information with a lead facilitator. The approach illustrates the interactive relationships between partners in CAPs by documenting processes from initially working together to true collaboration working towards a set criteria of goals and efforts (Behringer et al., 2018; Southerland et al., 2013). The current study has adapted this approach by using a semi-structured interview to build on the existing literature of community partners' perceptions of the overall CAP process (e.g., benefits, drawbacks, or other experiences).

External Factors Shaping CAP Outcomes

Literature on the role of fluctuating environments in partnerships have been extensive in the context of industry affiliated organizations; however, limited studies have assessed the impacts of external environmental factors on CAP network structure or CAP network-related outcomes in public health. There is even more limited research examining specific motivations or mechanisms for strengthening partnerships during periods of environmental fluctuations (Ahuja et al., 2012; Bunger, Doogan, et al., 2014). The current study had the opportunity to explore how a fluctuating environment related to the COVID-19 pandemic has influenced partnerships (e.g., ties) and outcomes over time. Deliberate decisions made to alter a network at the present time, in response to the environment, can have consequences for the CAP in the future (Ahuja et al., 2012). Observations expanded the line of research on external factors that may constrain or strengthen partnership networks.

Innovation to Address Gaps Using Systems Science Methodology

Studies on CAPs have indicated a significant gap in documenting the effectiveness of partnerships and an overall limited understanding on how partnership characteristics relate to successful or unsuccessful outcomes (Drahota et al., 2016; Lasker et al., 2001; Ortega et al., 2018). The mechanisms of how CAPs are formed and maintained is remiss in the literature, requiring systems science methodologies that can incorporate the interplay of contexts in complex systems (e.g., public health disparities) to identify what drives outcomes of the system (Harper et al., 2004; Luke & Stamatakis, 2012). While some studies have applied formative evaluations, many studies on CAPs have remained descriptive or conceptual (Franco et al., 2015). Some studies have proposed that the evaluation of health outcomes specific to CAP is not entirely well understood due to the lack of tools to assess partnership effectiveness (Kreuter et

al., 2000; Roussos & Fawcett, 2000; Shortell et al., 2002). Therefore, to better understand outcomes associated with CAPs, it is important to create tools that can assess partnership characteristics in the context of collaborative activities, such as resources shared, resources exchanged, or other types of interactions observed throughout its development (Mayer et al., 2017). Systems science methodologies offer useful approaches that can capture both the network level outcomes and partner characteristics affiliated with CAPs, along with the interactive processes observed throughout partnership initiation and sustainment over time.

Social Network Analysis (SNA)

The current study utilized social network analysis (SNA)—a systems science methodology—to integrate methods that can explore the function of collaborating agencies within a network, along with the quality of existing ties, ongoing collaborative activities, and other partner characteristics (Provan & Milward, 2001). Aligned with systems thinking approaches, SNA can be used to examine complex, adaptive systems, such as public health networks (Leischow et al., 2008; Litt et al., 2015; Luke & Stamatakis, 2012). Some studies have shown that extending beyond existing or established networks with new collaborations is integral to reach and systems change efforts in health (Altpeter et al., 2014; Nowell, 2009). At a systems level, partnerships (e.g., networks) can ultimately change the way communities perceive their surrounding contexts to conceptualize and solve social problems (Lasker et al., 2001), increase the capacity to address community health issues, and ultimately improve overall understanding of complex factors contributing to ongoing public health challenges (Best & Holmes, 2010; Foster-Fishman et al., 2007; Lasker et al., 2003; Leischow et al., 2008; Leischow & Milstein, 2006). The central focus of SNA emphasizes how relationships greatly influence behavior, beliefs, and outcomes at the individual, organizational, and community level of social systems

(Borgatti et al., 2013; Celentano, 2010). Thus, SNA offers an approach to assess the ecological components of service systems, taking into consideration the interplay of contexts from individuals, organizations, communities, and their social systems (Luke, 2005; Provan & Milward, 1995; Provan et al., 2005).

Public Health Studies Using SNA to Assess CAPs

Studies in public health are progressing towards integrative, system-level approaches with SNA (Bright et al., 2017, 2019; Chambers et al., 2012; Franco et al., 2015; Leischow & Milstein, 2006). Overall, prior studies in public health have applied SNA in healthcare settings to assess behavior change and social networks in relation to service provision, to assess as community capacity and resilience fostered from CAPs, and to identify gaps that limit the effectiveness of collaborative efforts (Bright et al., 2019; Chambers et al., 2012; Provan et al., 2005; Williams et al., 2018). SNA has also been used to inform and tailor the development of health interventions by integrating collaborations that can improve uptake and use (Chambers et al., 2012).

Collaboration through CAPs bridges social ties, which can then strengthen community capacity to problem solve and address public health concerns (Lasker et al., 2003). The inclusion of social networks that are otherwise unavailable also provides various support, resources, or motivation to communities in need of such capital (Lasker et al., 2003). SNA findings also have strategic value to funders and policy makers (Franco et al., 2015). For instance, funders can utilize details indicating a need for resource allocation and further support the justification for funding requests for a particular agency or community.

However, SNA is underutilized in studying network metrics of CAPs, in particular (Bright et al., 2017; Franco et al., 2015). Many studies examining CAP outcomes and processes

have been largely qualitative (Drahota et al., 2016). Few studies have used SNA to measure partnership characteristics to assess impact and effectiveness of CAPs, as well as examine how social networks may influence partnership outcomes (Bright et al., 2017, 2019; Honeycutt & Strong, 2012; Ortiz et al., 2020; Schoen et al., 2014); with only one study actually testing theory with multiple case study designs (Franco et al., 2015). Future research is urged to advance approaches methods that can assess the presence, strength or effectiveness of social networks in collaborations to move the field of public health forward and ultimately, lead to health equity (Aarons et al., 2014; Provan et al., 2005; Ross, 2017). Thus, social network-based approaches have great potential to benefit the field of public health and health services research (Provan et al., 2004, 2007; Rice & Yoshioka-Maxwell, 2015).

The Model of Research Community Partnership

A systematic review of CAPs indicated that there is no assessment tool available to assess characteristics of CAPs, as conceptualized for the current study (Drahota et al., 2016). To advance the field, the current dissertation project has integrated findings from the systematic review to create an assessment tool that follows an adapted version of the Model of Research Community Partnership framework (MRCP) (Brookman-Frazee et al., 2012). The study design was grounded on Brookman-Frazee and colleague's Model of Research-Community Partnership to better understand how partnerships function and change over time (Brookman-Frazee et al., 2012). The Model of Research Community Partnership is a conceptual model developed from literature across disciplines and informed by lessons learned from applying the model to real-world settings in the context of implementation research and mental health services (Brookman-Frazee et al., 2012; Garland & Brookman-Frazee, 2015). The Model of Research Community Partnership can help guide the development of CAPs and examine the dynamic changes of the

partnership processes (Brookman-Frazee et al., 2012, 2016; Drahota et al., 2016; Pellecchia et al., 2018). Additionally, the model can help researchers make more systematic interpretations of outcomes resulting from CAP efforts (Drahota et al., 2016; Garland & Brookman-Frazee, 2015).

The MRCP applies community-based participatory research (CBPR) principles to outline critical collaborative components needed for the initial and ongoing development of a CAP (Brookman-Frazee et al., 2012, 2016; Drahota et al., 2016). The model outlines the precedents of CAPs developing from formation to sustainment, allowing for the exploration and assessment of factors that occur throughout its development (e.g., activities, synergy, increased relationships). The model incorporates facilitating and hindering factors at the CAP's formation stage, proximal outcomes that capture activities occurring throughout the collaborative process; and distal outcomes that capture components that were impacted by the CAP's collaboration. MRCP also integrates community context in which the CAP is occurring (see Figure 1). A more recent adaptation of the MRCP has elaborated on components of engagement for partnerships formed in a system-driven implementation-as-usual study (Lau et al., 2020). In the adapted model, there is an added "initial considerations" phase that highlights initial motivations and concerns prior to the formation phase.

Proximal outcomes include partnership synergy, intermediate goals (e.g., aims of the pilot study), and creation of tangible products, such as presentations, trainings, or other accomplishments (Brookman-Frazee et al., 2012; Garland & Brookman-Frazee, 2015). Partnership synergy is grounded on the idea that more can be accomplished together rather than separately (Coombe et al., 2020). Specifically, partnership synergy refers to:

> A process whereby the knowledge and skills of diverse partners are combined to (a) foster new and better ways to achieve goals, (b) plan innovative, comprehensive

programs, and (c) strengthen the relationship with the broader community. (Garland & Brookman-Frazee, 2015, p. 11)

Partnership synergy can be reflected through knowledge exchange, act as a proxy for partnership dynamics and is central to partnership effectiveness (Coombe et al., 2020; Garland & Brookman-Frazee, 2015; Lasker et al., 2003). Partnership synergy can detail what community and academic partners learned from one another or co-created through the CAP. Intermediate goals refer to the extent to which a CAP has met any of its short-term, initial goals. Intermediate goals can be examined through partners' perception of CAP success and/or engagement with the CAP. The creation of tangible products can be assessed through the presence or absence of activities (e.g., research presentations or publications), participation in events, or other forms of concrete products that indicate progress toward the CAP's goals (Garland & Brookman-Frazee, 2015).

Distal outcomes refer to outcomes that benefit both participating CAP members and agencies beyond the purpose of the project (Brookman-Frazee et al., 2012; Garland & Brookman-Frazee, 2015). Distal outcomes can describe the sustainability of the partnership infrastructure for future collaborations (Brookman-Frazee et al., 2012; Garland & Brookman-Frazee, 2015). For instance, one case study of a CAP with mental health professionals demonstrated how therapists applied their newly developed skills in their own healthcare settings beyond the partnership (Garland & Brookman-Frazee, 2015). Other outcomes may demonstrate how partnering agencies place more value on the integration of community members into their decision-making processes due to what they've learned in the CAP process.

Of note, studies on CAPs have utilized a variety of strategies to initiate and maintain stakeholder engagement based on models of engagement, including CBPR principles and participatory approaches (Drahota et al., 2016; Israel et al., 1998). However, the conceptual

terms therein these approaches are very nuanced. The current study applies the MRCP primarily because of its emphasis on the bidirectional, interactive nature of ongoing partnership processes on more inclusive systems change efforts rather than strictly participatory procedures (Drahota et al., 2016; Pellecchia et al., 2018). For instance, in some cases a CAP may have initiated research trainings based on the aims written into the grant rather than input from community members. Thus, some decisions may not have been wholly participatory by nature but intended to design activities for engaging community partners (Frank et al., 2015).

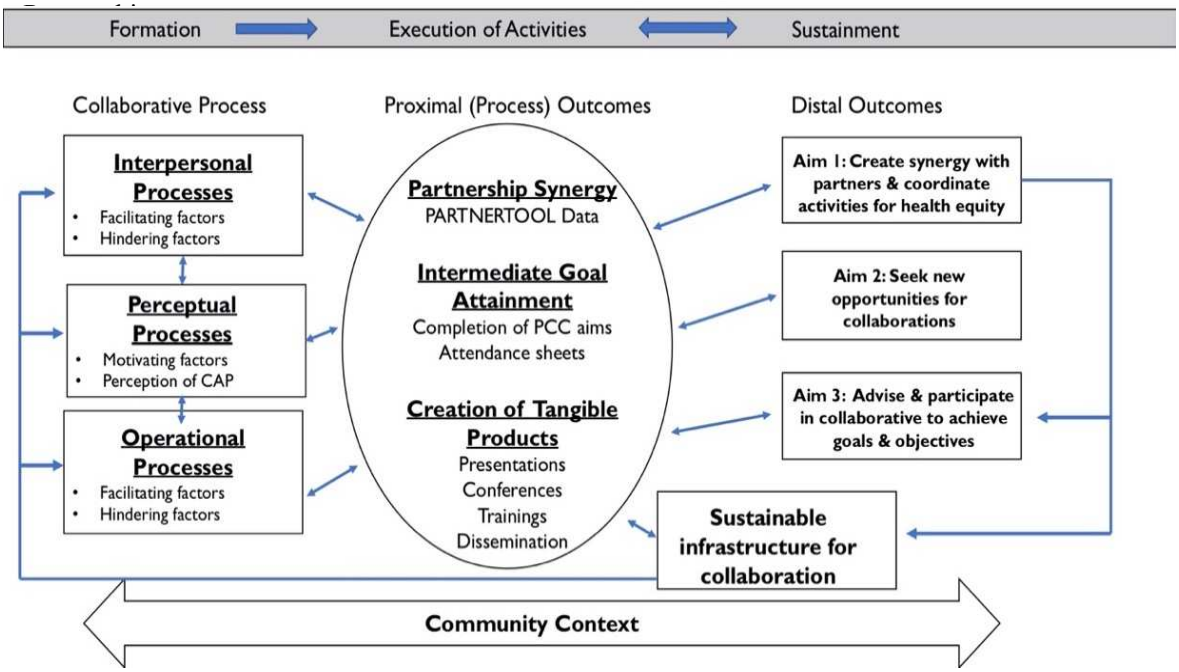
The Current Dissertation Project Adapted the MRCP to Describe and Examine a CAP Focused on Health Equity Efforts

Adaptations to the model were grounded on Lau's modified version incorporating stakeholder perspectives of motivations and concerns. For the formation stage, the current study identified facilitating and hindering factors to interpersonal processes and operational processes (see Figure 1).

Figure 1.

Adapted Model of Research Community Partnership

Figure 1. Adapted Model of Research Community



Interpersonal processes referred to factors in establishing relationships and trust, clarity of roles and responsibilities, and complementary goals. *Operational processes* were specific to the CAP's infrastructure, including factors related to administrative support, leadership, and communication. Given the review of literature on how community partner perceptions can impact CAP participation and lead to varied outcomes, the current study added *community partner characteristics* as a preceding component that can impact the formation of a CAP. The component included motivating factors to join a CAP and partner's perception of CAP success. Both factors have demonstrated impact on collaboration outcomes in the literature.

The next stage, execution of activities, collected information on proximal outcomes, including the creation of tangible products with CAP members, indicators of partnership synergy, and indicators of intermediate goal attainment. The creation of tangible products created

by CAP members included publications, presentations, community recognition/awards, advocacy, grants/contracts, conferences/trainings held, supplemental intervention materials, or any existing dissemination marketing tools (Brookman-Frazee et al., 2012). Partnership synergy referred to partner's level of involvement, collaborative activities, ties to other agencies, and other characteristics that describe the relationship between partners (Lasker et al., 2001). Intermediate goal attainment can measure the extent to which the CAP meets its aims, along with the sustainment of partnerships. The current study identified perceived goals of the CAP and assessed the extent to which the goal was met from the perspective of partners.

The third stage, sustainment, described distal outcomes. Distal outcomes have been conceptualized as binary data, determining whether a CAP meet its overarching goals. Prior studies have used participation rates from sign in sheets completed at each CAP meeting (Brookman-Frazee et al., 2012). For the current study, partners were asked whether they gained anything from CAP that can be applied in future collaborations or health equity practices.

Additionally, while the Model of Research-Community Partnership has been proven useful in highlighting iterative and dynamic processes of CAPs (Lau et al., 2020), social network analysis has not been used to assess factors described in the MRCP. To the author's best knowledge, this was the first study to assess the framework using SNA to document and measure ties and relationship qualities in a CAP, their ongoing interactions (e.g., activities), and factors that can influence the CAP's success over a 12-month period.

Study Rationale

Mechanisms of change within CAPs have not been fully reported and are understudied in the literature (Pellecchia et al., 2018). There is a need to understand networks of CAPs as a process preceding public health outcomes (Bright et al., 2019) As an attempt to document the

developmental processes between partners and the infrastructure of the CAP, the current dissertation project collected longitudinal data on activities occurring throughout the partnership development from initial development in 2020 to 2021. The framework guided which factors to consider and data collection procedures (more details are provided in the methods).

Further, many partnership assessments on CAPs do not typically provide information on how types of relationships (e.g., sharing resources or exchanging information) among partners influences the larger collaborative goal or ultimate success of the CAP (Provan et al., 2005; Williams et al., 2018). Understanding who is involved and whether those involved includes a diverse array of agencies will help inform collaborative processes. There is also a need to better understand factors that promote the success of partnerships with strategies to overcome challenges (Bright et al., 2017; Franco et al., 2015; Williams et al., 2018). In the absence of such knowledge, identifying strategies or practices that have led to successful public health outcomes using CAPs will likely remain difficult. The current study explored the facilitators and hindrances to the CAP process, guided by preliminary findings from the existing literature (Drahota et al., 2016).

Bridging social ties is essential for the effectiveness of a CAP to improve community health (Lasker et al., 2003). More importantly, it is critical to acknowledge the perspectives of community members both on the process of CAPs and on their motivations for participating in CAPs. As discussed, this area of literature is understudied. The current dissertation project contributed to the literature on CAP perspectives by having explored the motivational factors that drove partners to participate in CAPs and how such factors impacted collaboration. In terms of impact, this research on CAP collaboration can inform future efforts to develop and maintain successful partnerships for health equity. In utilizing SNA, the project explored network

structure and outcomes, barriers, and facilitators to CAP collaboration, and examined how network ties relate to CAP experiences and outcomes.

Flint Center for Health Equity Solutions (FCHES)

In areas like Flint, Michigan, health disparities are widening—urging public health researchers and health professionals to shift focus to health equity efforts. Flint is located in Genesee County in the state of Michigan and has faced historical events that have compromised its local social and economic state, along with facing "racial abandonment, scientific arrogance, government inaction, and direct harm" (Carrera et al., 2019, p. 3). According to the U.S. Census, the city of Flint is nearly 42% below the nation's poverty rate and nearly half of the median household income for the entire state. More than half of Flint's residents are ethnic minorities, with 56% of residents identified as African American (US Census Bureau, 2006). Moreover, Flint has demonstrated dramatic declines in local government capacity and policy, prioritizing the role of CBOs, such as non-profits, in taking on more responsibilities to face local crises (Reckhow et al., 2019). Here, relationships and collaboration with other sectors becomes critical for the long-term success of Flint's resilience and recovery (Carrera et al., 2019; Reckhow et al., 2019). With the ongoing environmental crisis (i.e., Flint water crisis), Flint is viewed as a visible expression of the *interconnectedness of race, power, money, and health disparities* (Amadi, 2017). This view highlights the complex, socio-ecological factors that can perpetuate health disparities. To fully address disparities in this area, community-based practitioners, community members and academic researchers, each bringing unique resources, must work together to strengthen and create new strategies that deliver wider-ranging public health efforts (Litt et al., 2015).

The Flint Center for Health Equity Solutions (FCHES) is a collective effort aimed to minimize health inequities and promote health equity among underserved ethnic and racial minorities in Genesee County. With public health researchers, practitioners, and community members at the frontline, the FCHES has attempted to redirect public health efforts to include more systems level thinking to improve social conditions and policies that play a role in perpetuating the gap in health-related outcomes. The FCHES is a NIMHD-funded research center focused on health disparity and equity research in Flint, Michigan, and is comprised of four cores: (1) Administrative core; (2) Dissemination and Implementation Science Core; (3) Methodology core; and (4) Partnership Consortium Core (PCC) and two research projects. The PCC was designed as a CAP with the purpose of building infrastructures to create sustainable health equity solutions in Flint and across the region. Guided by the MRCP (Figure 1), the current study explored the formative development of the PCC CAP over a one-year period of FCHES's NIH grant funding (January 2020 – January 2021).

Research Questions

The current dissertation project was designed to address the following research questions:

RQ1. What factors facilitate or hinder the development of CAPs over time?

How did external factors related to COVID-19 influence the CAP?

How have these factors changed over a year?

RQ2. How do network outcomes change from time-point 1 to time-point 2?

What are the CAP network outcomes? How do these network outcomes vary by partner type?

RQ3. How does perceived success from timepoint 1 differ from timepoint 2?

How do SNA measures and organizational characteristics ("trust" and "value") relate to partners' perception of CAP success at T1 and at T2?

RQ4. What are the partners' motivating factors to engage with the CAP at T1 and T2?

How have motivating factors changed across time-points?

CHAPTER 2: RESEARCH DESIGN AND METHODS

Decisions in the research design and methods have been made for the current dissertation to determine its contributions to scholarly work. This chapter provides a detailed description of the overall proposed research approach that was utilized for the project.

Overall Proposed Research Approach

Case Study Design

The dissertation used an instrumental case study design. Case studies are thorough explorations of a particular event, object or phenomenon of interest (Berg, 1968; Crowe et al., 2011). Historically, case studies have been utilized to empirically investigate complex processes in organizational settings and in other social sciences to explain, describe or explore phenomenon of interest within the context it occurs (Crowe et al., 2011; Yin, 2014).

There are three main types of case studies with each differentiated by their purpose: (1) intrinsic; (2) instrumental; and (3) collective (Crowe et al., 2011). Briefly, intrinsic refers to case studies that are designed to study a unique phenomenon, whereas collective case studies include multiple cases in order to generate a theory or collection of details about a particular event or phenomenon. The proposed dissertation, however, utilized an instrumental case design—case studies to obtain a broader understanding of the issue or phenomenon. An instrumental case study design can broaden understanding of CAP collaboration and changes over time, with more detail on the contexts in which partnerships are actively occurring (e.g., facilitators, barriers, network characteristics).

One benefit to case study approaches is that they are flexible, which is useful when collecting data from naturalistic situations (Crowe et al., 2011; Lalor et al., 2013). Because data was collected on ongoing partnership dynamics of a CAP within a research consortium, a

flexible tool that could document these processes was needed. Moreover, case studies can be powerful research strategies when applied with sequential explanatory mixed methods by adding more comprehensiveness to understanding complex issues, such as those reflected in CAP collaborations in public health (Berg, 1968; Lalor et al., 2013; Yin, 2014).

In case studies, methods for data collection are selected pragmatically, allowing for the use and practicality of qualitative and quantitative paradigms to understand CAP collaborations (Berg, 1968; Darke et al., 1998; Yin, 2012). Case studies have also been frequently used in tandem with network-related studies and in prior studies assessing CAPs across various contexts. In fact, a systematic review on CAPs demonstrated that all included studies applied a case study design with qualitative, quantitative or both methodologies (Drahota et al., 2016). Further, another review summarized that a wider range of network studies in child mental health collaboratives applied case study designs than any other type of design (Bustos, 2020); yet, of note, these designs have been critiqued for their limited generalizability.

The advantages and disadvantages of case study designs were considered when making decisions for the current project. Some disadvantages to case study designs relate to generalizability and potential compromise to scientific rigor (Gibbert et al., 2008; Gibbert & Ruigrok, 2010; Yin, 2014). However, case studies are grounded on multiple forms of data sources, providing a unique and comprehensive understanding of contexts at the individual, organizational, social or political level, as it occurs in naturalistic settings (Crowe et al., 2011; Lalor et al., 2013; Yin, 2012). Such rich data can better inform the experiences of partners in CAPs, helping researchers identify areas that can be improved to foster collaboration for health equity. Given this, the use of a case study design was considered the best strategy that aligned

with the dissertation's aims and goals and would provide valuable insights into CAPs within underserved communities.

Two-Phase Sequential Mixed-Methods Approach

Moreover, the dissertation project involved a longitudinal, sequential explanatory mixed methods research (MMR) design (QUAN → QUAL) with one instrumental case study of a CAP. A two-phase sequential mixed-methods approach provided: (1) the breadth of collaboration to detail number of ties, frequency, level of collaboration, and other relationship qualities; and (2) the depth of collaboration to explain and contextualize perceptions and experiences with the CAP that are not made explicit through quantitative data. The MMR design included one data collection phase at time-point 1 and two data collection phases at time-point 2 (January 2020 and January 2021) (Creswell & Plano-Clark, 2011; Ivankova et al., 2006). In the first phase, quantitative data was collected and analyzed; in the second phase, qualitative measures building on the quantitative findings were collected to expand, explain, or elaborate on the results. Both data strands were then converged before the end of the study with a joint display, allowing for the qualitative data to expand on findings from the quantitative phase (Palinkas et al., 2019). For time-point 1 (January 2020), only the quantitative phase was carried out due to lack of response from community partners during the onset of COVID-19 in March. However, both quantitative and qualitative phases were carried out for time-point 2 (January 2021). The study was approved by Michigan State University's Institutional Review Board at time-point 1 and continuation of the study was approved at time-point 2 (#CR00001249).

Study Design Justification

Sequential explanatory MMR was considered the best approach to examine CAPs with the use of qualitative results to further interpret quantitative findings (Creswell, 2014; Creswell

& Plano-Clark, 2011; Ivankova et al., 2006). MMR allows for the exploration of two different perspectives: one perspective collected from close-ended responses (e.g., network survey); the other collected from open-ended responses (e.g., interviews) (Creswell, 2014). Such procedures increase the comprehensiveness and understanding of CAP processes demonstrated in the FCHES Partnership Consortium Core (PCC) by adding the breadth and depth of both underlying and surrounding contexts.

In designing this dissertation, considerations were made regarding advantages and disadvantages of using sequential explanatory MMR. While this design may be more time-consuming and require additional resources to fulfill each data collection phase, results arising from this approach allowed for a thorough exploration of the dynamic changes that occurred within partnerships between community members and academic partners. This design can advance the existing literature on the perspectives and motivations of community members to participate in CAPs, along with facilitators and barriers that foster more ties among partnership members *over time*. Such information would not be comprehensive without the quantitative changes in the network ties or characteristics of those collaborative relationships (e.g., frequency, level of influence, level of involvement, etc.).

Study Design Guidelines

Currently, there is limited knowledge and understanding about best practices for longitudinal mixed methods designs due to its complexity and lack of standardization across studies (Plano Clark et al., 2015). To ensure scientific rigor, the study integrated recommendations from Plano-Clark et al. (2015) for researchers implementing longitudinal mixed methods approaches (see Table 1). Specifically, transparency in study design and procedures were prioritized to facilitate replicable application of this design and methods to

future projects that focus on similar partnership dynamics. Additional guidelines were followed from Palinkas and colleagues' (2019) procedures for innovations in mixed methods assessments.

Table 1.

Reccomendations for Longitudinal Mixed Methods Design

Carefully plan and fully describe the dimensions of correspondence, timing, mixing, level of analysis, and use of time within the study's design. Include expertise in longitudinal quantitative, longitudinal qualitative, and mixed methods on the research team to help negotiate these issues.
Develop a table or figure that clearly outlines the sample and major quantitative and qualitative data collection for each time point in the study to succinctly and accurately describe the flow of procedures.
Articulate how time is conceptualized and measured. Resist collapsing longitudinal data into single categories, thereby losing the temporal information.
When longitudinal qualitative data are collected, incorporate the time dimension into the analysis. At a minimum, note the time point for participant quotes. When appropriate, attend to the development of themes or perspectives within themes across time.
Be cognizant of missing data and its implications for the quantitative, qualitative, and integrative analyses. Discuss how missing data are handled in the analysis and the implications for the results.
Think creatively about how to incorporate the longitudinal component when integrating the quantitative and qualitative results. Possibilities include merging the results in terms of quantitative and qualitative patterns over time, developing typologies based on patterns over time, and comparing the different results for each point in time.

Source. Plano Clark et al., 2015

Phase 1: Quantitative Phase (January 2020 and January 2021)

Participant Sample

The Flint Center for Health Equity Solutions (FCHES) is a Transdisciplinary Collaborative Center (TCC) funded by the National Institute of Minority Health and Health Disparities, an institute within the National Institutes of Health. FCHES is housed in Michigan State University's College of Human Medicine, Division of Public Health, and is located in Flint, Michigan. The FCHES focuses on health disparities research centered on issues specific to

the Flint community. The FCHES is comprised of four cores: (1) Administrative core; (2) Dissemination and Implementation Science Core (DISC); (3) Methodology core; and (4) Partnership Consortium Core (see Table 2 for more detail). The current study focuses only on the FCHES Partnership Consortium Core (PCC) because of its potential nature and function as a CAP. Of note, the PCC began in 2016 co-led by two academic PIs – one senior academic overseeing the direction of the PCC and one early career academic who operated the PCC – and a community co-director. The PCC was substantially reformed in 2019 with new early career academic and community co-PIs. The senior academic PI remained and continued to provide oversight of the direction of the PCC and became more involved in the operations of the PCC (e.g., participating regularly in PCC leadership meetings, for example). Given these changes, the CAP was considered to be in its initial formation stages (e.g., starting over), providing this project with the opportunity to examine its overall development from nascent stages.

Participants were recruited from the PCC, the inter-organizational CAP of interest, to explore CAP processes over time. For the remainder of the dissertation, the PCC will be referred to as the "CAP." All partners who had been participating with the CAP prior to or since January 2020 were sampled to collect details on their experiences with the collaborative.

Table 2.

Flint Center for Health Equity Cores

FCHES Cores	Activities
Administrative Core	Maintains external communications with the funding agency, provides administrative support for all of the Center's components, facilitates the expansion of consortium partnerships under the umbrella of the Center, coordinates, administers, guides, supports, reviews, and manages FCHES activities, and facilitates collaborations within and outside of the Center.
DISC	Disseminate research to translate and widely communicate findings from FCHES research to stakeholders using planned, and targeted strategies. This includes spreading information to collaborators, communities, service providers, decision-makers, policymakers, consumers, and the public locally regionally and nationally.
Methodology Core	Conduct Dissemination and Implementation Research to produce useful and generalizable knowledge about what we have learned to further advance the field of D&I. Take stock of assets in the community which engender healthy behaviors and positive mental, behavioral, and physical health outcomes, and identify gaps in service provision and other needs to frame the work that our other cores will perform.
PCC	Develop and implement health equity-driven, action-oriented research that is collaborative, transdisciplinary, and translational with goals to reduce health disparities and health inequities in Flint, Michigan and provide a framework for action-oriented health equity research and policy advocacy initiatives more broadly in Region 5 *(Illinois, Indiana, Ohio, Michigan, Minnesota, Wisconsin)* and nationally.

As of January 2020, the CAP was comprised of 27 agencies within Genesee County, including community members, academic partners, and policymakers at the local, state and national level. Participating organizations are in healthcare settings or health-related sectors focused on health policies, health services for marginalized communities, state legislative, health coalitions, county health boards, community health boards, or other community-based efforts in advocacy (see Table 3 for study sample). This diverse group of stakeholders made up the CAP's inter-organizational network. The CAP's purpose was to build infrastructures to create sustainable health equity solutions with existing partnerships in Flint and across the region. Specifically, the CAP's role was to:

> (1) create synergy with collaborative partners and to coordinate activities in a way that builds trust and minimizes duplication of effort, fills gaps in existing regional efforts, and mobilizes and leverages resources; 2) seek new opportunities for collaborations, including expanding the consortium to include relevant new partners; (3) advise and participate in all aspects to achieve goals and objectives across all Cores. (NIMHD Grant Project Summary, 2017)

Guided by the MRCP framework, the formative development of the CAP was examined over a one-year period during the third year of FCHES's NIMHD grant renewal (January 2020 – January 2021). Of note, 2021 was the final year of the grant, with option to apply for a no-cost extension.

Table 3.

Study Sample for Time-Point 1 and Time-Point 2

Academic Partners	Local Community Partners	National Community Partners	Policy Makers
***n* = 4**	***n* = 18**	***n* = 3**	***n* = 2**
• CERB Methodology • Flint Center for Health Equity Solutions (FCHES) • University of Michigan – Flint • University of Michigan	• American Muslim Community Services • Artistic Vision Enterprise • Building Bridges into the Future • CBOP • Community Outreach for Families & Youth Center • Flint Odyssey House, Inc. • Genesee County Board of Health • Genesee County Health Dept • Genesee Health Plan • Genesee Health Systems • Greater Flint Health Coalition • Hamilton Community Health Network • La Placita • Latinos United for Flint • Michigan Community Health Workers Alliance • Michigan Public Health Institute • Region 10 Prepared Inpatient Health Plan • Wellness Aids Services, INC.	• National Center for African American Health Consciousness (NCAAHC) • National Collaborative for Health Equity (NCHE) • National Office of Health Programs (NAACP)	• State Rep • U.S. Senate

Eligibility Criteria

All PCC members representing participating agencies within the CAP were recruited to participate in Phase 1 data collection in January 2020 and again in January 2021. To participate in the study, participating agencies needed to be engaged with activities specific to the CAP or engaged with other FCHES-related activities. All participants needed to meet the following eligibility criteria: (a) represent a participating agency in the CAP; (b) read and speak proficiently in the English language; and (c) be 18 years of age or older. In collaboration with the doctoral advisor, three indicators of engagement were also created to develop a more systematic approach to the sampling criteria. Prior studies have operationalized active participants of CAPs

as members who attended at least 30% of the most recent total number of meetings (Bowen et al., 2017; Eisinger & Senturia, 2001). Similar justifications were applied within the context of the CAP to represent "engagement." The first indicator was related to the first event of the CAP in January 2020, the Convening and the second convening in May 2020. If participants were sent an invitation to this event and responded (either yes or no) to the RSVP, then this indicated engagement. Of note, the second convening scheduled to occur in May 2020 was cancelled due to COVID-19 policies. Another indicator of engagement related to the number of activities, events, or other forms of communication (e.g., email) that a partner had participated in. If a participant responded to multiple FCHES prompts (via email) or attended events or activities prior to the Convening, then this indicated engagement. Indicators of engagement were assessed using meeting minutes and ongoing discussions with the CAP Co-Principal Investigator. Participants needed to have met at least one of these engagement indicators to be included in the final analysis. One partner was removed from analysis due to lack of engagement with the partnership over the one-year period study timeframe.

Recruitment

The FCHES Dissemination and Implementation Science Core (DISC) study personnel recruited respondents from the entire sample of participating agency members already existing in the consortium (n = 27) in January 2020 and again in January 2021. Purposive sampling procedures were used to sample from key representatives who were the most knowledgeable about their agency's participation with other agencies participating in the CAP. Purposive sampling procedures are a type of non-probability sampling that is most efficient to use with studies that aim to collect information that is only held by certain members in the community (e.g., experts or key leaders) (Tongco, 2007). In this case, key representatives were members

who attended meetings, completed evaluation assessments, and acted as site facilitators to communicate between the CAP and their affiliated agencies (see eligibility criteria, above). If there was more than one member from a participating agency, purposive sampling as well as discussions with the Co-PI, was used to identify the partner who would know more about their agency's involvement with the collaborative. CAP partners were recruited based on their role in the CAP; this meant that the CAP representative from the partnering organization was asked to complete the survey and interviews. The project **did not require the same individual** to participate at both time-point 1 and time-point 2, but rather the person who was the organization's CAP representative at the time of data collection and who was expected to be the most knowledgeable of their given agency's involvement with the CAP. Additionally, a recruitment email was distributed to all key representatives, detailing information about the study's purpose and participation incentives, expected activities involved in the study, and participant eligibility to participate in the network survey and interview. These materials were distributed through email and through Qualtrics. See Appendix I for recruitment materials.

Procedures

Data collection procedures are described in sequential steps taken to initiate the project. First, the section will discuss procedures to obtain buy-in, strategies to identify the network boundary, and strategies to enhance response rates for quantitative measures. Then, a step-by-step description of how data has been collected is provided.

Obtaining Buy-In

The opportunity to collaborate with the CAP was facilitated through Dr. Amy Drahota's existing peripheral involvement with the CAP (e.g., Dr. Drahota is the Academic PI for the FCHES DISC). First, the FCHES Consortium has several procedures put in place before

initiating projects and data collection. To move the project forward, the researcher needed to obtain buy-in from the community core representative and academic Co-PI and PI of the CAP. To facilitate this discussion, a brief proposal was created to outline the goals of the project, the potential outcomes, and the potential benefits to FCHES, partnering agencies, and the Flint community as a whole. The dissertation advisor arranged for a meeting between the CAP PI, Co-PI, and community core PI to discuss the proposal, discuss its relevance to the CAP's goals, and to obtain support from community representatives. After the meeting, the project was approved, permitting the researcher to begin data collection once approval from the Michigan State University (MSU) Institutional Review Board (IRB) with modifications to the broader grant project was received.

Identifying Network Boundary

To obtain a comprehensive list of participating agencies in the CAP, several meetings with the CAP's academic co-PI and the research assistant who had maintained all records of meetings and prior survey distributions were scheduled. Discussions from these meetings confirmed that the list was the most up-to-date list of agencies participating in the CAP to their best knowledge. The researcher accessed the names of key representatives for each participating (or listed) agency and their contact information (e.g., email, telephone, or both). When contact information was not correct, the affiliated agency was then contacted for updated information to recruit the key representative. All files containing contact information were stored in MSU's SharePoint using a password protected server.

Response Rate Strategies

For this data collection phase, the project utilized several strategies to increase response rates as much as possible in order to capture the full picture of the CAP. At time-point 1, a $15

incentive was used to compensate participants' time to complete the survey. This was expected to increase willingness to participate in the study and encourage survey completion. At time-point 2, the incentives were raised to $50 with approval from the IRB to increase response rates during the pandemic. The researcher also incorporated up to $100 charitable donations, which, in combination with an option to obtain a $50 gift card, has shown some evidence to increase likelihood of participation to incentivize leaders or staff in health-related settings (Conn et al., 2019; Parkinson et al., 2019). Second, the researcher recruited a former intern who had been extensively trained in participant recruitment strategies with prior existing projects with the DISC. Given their involvement with prior projects in the CAP, it was expected that the intern had gained familiarity and trust with several of the agencies and respondents represented in the current network. This facilitated follow-up phone calls and emails since most of the key representatives had already communicated with the intern about other CAP-related projects.

Procedures to increase response rates for the survey included: an initial email distribution providing the recruitment flyer, survey link, and invitation to the FCHES Convening, three follow-up phone calls detailing the project followed by an email, and leaving a message if there was no response after each call. The intern and researcher collaboratively completed these procedures with materials, including (a) a script for the phone call, which was personalized for each participant and (b) a draft of the email that was distributed after the phone call (see Appendix I). At time-point 2, the researcher and intern utilized google phone to call participants from personal mobile devices with a Flint area code, in hopes that participants would respond to a call from their area and to overcome challenges in not having access to the personnel's office space. Additionally, emails were flagged as "high" priority. Throughout the entire process, participants' names and contact information were stored in a password protected MSU server

only accessible to the research personnel (e.g., researcher and intern). Procedures for recruiting participants to complete the interviews are described in the section entitled, "Phase 2- Qualitative Phase." Further, the researcher attended the FCHES Convening in January 2020 to provide paper copies of the survey with a self-addressed and stamped envelope to respondents who had not completed the survey at time-point 1. Efforts were made to mail the paper version of the survey to listed agencies that had not completed the electronic version of the survey at time-point 2 in January 2021. However, the researcher was only able to mail hard copies to partners who owned personal businesses (whose address was accessible through a business entity website). Given the constraints of COVID-19 and organizational policies to work at home, mailing hard copies to all partners who had not responded was not possible at time-point 2. All mail was sent certified to assure receipt.

Data Collection

Data collection for time-point 1 began in Spring 2020 and data collection for time-point 2 began in Spring 2021. Once a comprehensive list of participating agencies in the CAP was finalized, all contact information was obtained, and procedures to increase response rate were in place, a PARTNER Tool network survey was distributed to all key representatives in January 2020 and again in January 2021. The survey was emailed to key representatives at least 4 times with the follow up calls and emails to increase response rates. FCHES has had prior difficulty obtaining responses from the CAP members; with this expectation, the researcher made sure to apply these procedures thoughtfully and with consideration of partners' time. Once surveys were completed, a gift card was sent out to each respondent electronically. $50 gift cards for time-point 2 were mailed certified to the address provided by participants in the survey. After the gift card was mailed, the intern sent a confirmation email with either a tracking number or donation

receipt. Respondents who did not complete the survey online and who attended the FCHES Convening (January 2020) were provided with a hard copy of the survey, along with a self-addressed and stamped return envelope mailed directly to the PI at MSU. Hard copy surveys were provided to 3 participants at time-point 1. For time-point 2, 2 hard copy surveys were provided to 2 participants. All responses were uploaded to the survey platform in PARTNER tool.

CAP Core Leader Meetings

An important component of the project included a meeting with CAP core leaders about preliminary findings informing the ongoing process and outcomes of the CAP. One meeting was conducted during summer 2020 and another one is planned for summer 2021. These meetings were designed to elicit CAP core leaders' input, reactions, and to discuss potential ways that the findings could inform collaboration strategies to strengthen health equity efforts in the Flint community. Visual sociograms from the SNA were presented to the CAP Core leaders for feedback and discussion. A community report was provided via an infographic for ease of communication. In the spirit of community psychology, these meetings aimed to foster collaboration between researcher and participants and document community input on the presentation and interpretation of findings.

Quantitative Measures

The study utilized quantitative measures that applied and adapted items from the PARTNER tool, prior studies exploring CAPs in the context of CBOs providing autism spectrum disorders (ASD) services (Gomez et al., 2021) and a systematic review summarizing the facilitators and barriers of CAPs based on existing literature (Drahota et al., 2016). The next section details adaptations made to the measures and which items were pulled from each source.

PARTNER (Program to Analyze, Record, and Track Networks to Enhance Relationships) Tool

The PARTNER Tool is a social network analysis tool designed to assess collaboration efforts among partners within a collaborative, such as the CAP. The tool includes an online survey that can be administered to collect data and analyze data with visual sociometric displays to demonstrate collaborative activity and network changes. The survey was adapted to collect information on (1) facilitators and barriers to CAPs; (2) partners' motivations to participate; (3) demographics; (4) perceived goals; (5) perceived success; (6) trust; (7) perceived value; and (8) network metrics on interactions between partners. These details provide insight into characteristics that have contributed to the ultimate success of the CAP's goals (Williams et al., 2018). Efforts were made to incorporate the context of the CAP into the survey, along with adapting items from barriers and facilitators to CAPs (Drahota et al., 2016; Gomez et al., 2018; Meza et al., 2016). Each of these items are discussed in more detail below.

CAP survey. The original CAP survey included a list of facilitating and hindering factors of collaboration. The items in the survey were based on findings from a prior systematic review that summarized barriers and facilitators of CAPs across various settings (Drahota et al., 2016). For the project, the CAP survey items were used and adapted to create two multiple response items on the network survey. One item asked participants to select factors perceived as a facilitating the CAP and the other asked participants to select factors perceived as a hindering the CAP. This was done to collect information on how participants perceived the ease or difficulty of collaboration; these responses were further explored in semi-structured interviews.

Decision to Participate Questionnaire (DPQ)

The 15-item Decision to Participate Questionnaire (DPQ) was created to assess reasons for participating or declining participation in a CAP from the perspective of community stakeholders (Meza et al., 2016). The DPQ was adapted from the AIM HI Clinic Participation Survey, which was used to help a team of providers serve an increasing number of clients with ASD within mental health service systems more effectively (Brookman-Frazee, 2012; Meza et al., 2016). For the current project, the 15-item DPQ was adapted as one multiple response item that asked participants to select their motivations for joining the CAP at time-point 1 and motivations for continuing participation at time-point 2 (see Appendix II for a full list of items). Responses to this item provide important preliminary details on the motivation to participate or continue to participate in a CAP from the perspective of community partners.

Demographics

Demographic details were collected through the survey, including details on: (1) agency/institutional affiliation, (2) agency role, (3) duration of time involved with FCHES, and (4) organizational contributions. For items 1-3, responses were collected as open-ended responses. For item 4, participants were provided with a multiple response format to first indicate all organizational contributions to the partnership. Participants were then asked to select their agency's *most important* contribution to meeting the CAP goals. The items included resources and activities generated through the PARTNER Tool Survey. To increase external validity, several meetings with the academic Co-PI of the CAP were used to tailor the items to match the CAP's context (Francisco & Butterfoss, 2007). An "other" option was included to provide participants with the opportunity to specify their agency's contributions, if needed. Additional

demographic information on the type of partner (e.g., local, national, core) was also collected in ongoing discussions with the Co-PI of the CAP and archival records.

Perceived CAP Goals

Participants were asked to describe the outcomes of the CAP from a list of options generated through the PARTNER Tool. Responses were in multiple response format. After indicating CAP goals, participants were then asked to identify the most important outcome out of the options selected in the prior question. Similar to procedures used to design demographic items, meetings with the academic Co-PI were utilized to increase the external validity of the items. Details from these items were expected to provide participating agency's representative's perspective on what they consider as the most important goals of the CAP; such details can be useful when trying to develop a shared understanding of the mission and goals of a collaborative to improve ongoing efforts.

Perceived CAP Success

In addition to perceived goals, participants were asked to rate how successful the CAP had been at reaching its goals toward health equity. A Likert type scale, ranging from 1- *Not successful* to 5- *Completely successful* was used. Perceived success of the collaborative is deemed critical to network effectiveness (Feinberg et al., 2004; Northrup, 2007) and carries important implications on individual-level outcomes. For instance, perception of success can influence a partner's level of engagement in activities that demonstrate support beyond the collaborative itself (Litt et al., 2015).

Trust

In the PARTNER Tool, trust among partners was measured as an index of three questions asking about the extent to which other organizations in the network are (1) reliable, (2) share

mission congruence, and (3) open to discussion. Responses for trust used Likert type scales ranging from 1 – *not at all* to 4 – *a great deal*. For the current study, the question on reliability was removed from the survey because core leaders did not perceive that component relevant to the CAP. This may have been because the CAP core leaders typically viewed themselves as the source for reliability rather than their broader partners.

Perceived Value

Perceived value of partners was measured as an index of three questions asking about each organization's value to achieving the overall mission of the CAP in terms of (1) power/influence, (2) commitment, and (3) resource contribution (Varda et al., 2008b). Responses options are in Likert type scales ranging from 1- *not at all* to 4 – *a great deal*.

Network measures. *Whole network metrics* included measures of: (1) network density, (2) degrees of centralization, and (3) trust. Network density refers to the percentage of existing ties out of all possible ties (Celentano, 2010; Fredericks & Durland, 2005). Network density demonstrated the number of ties out of all possible ties within the network and can be used to inform the extent of cooperative relationships between partners in a collaborative (Nowell, 2009). Understanding social ties resulting from participation can also be viewed as a proximal outcome to CAPs (Lasker et al., 2003). Lower measures of density carry implications on the number of existing opportunities to increase connections among partners within a collaborative (Celentano, 2010; Fredericks & Durland, 2005). Degrees of centralization indicate the extent to which one or other organizations are more centrally connected (e.g., evenly) than others in the network (Provan et al., 2007). More centralized networks can improve collaborative efforts in the context of public health (Retrum et al., 2013).

For *node-level network* measures, the PARTNER Tool calculates: (1) degree centrality, (2) closeness centrality (3) connectivity and (4) redundancy. In-degree centrality is the number of ties to an organization within the network (Provan et al., 2007; Valente et al., 2015). Out-degree centrality accounts for the number of ties a given agency indicates with another agency (Provan et al., 2007). The measure of degree centrality indicated the number of connections each individual agency has to other members of the network. Closeness centrality measured how far each agency is from other members of the network calculated by the number of links between each member. A higher score of closeness centrality indicates a shorter distance between each agency in the network (Provan et al., 2007). Agencies with high closeness centrality are considered key players in a social network because they can easily reach other agencies/individuals within a network (Luque et al., 2011; Valente, 2010). Relative connectivity is calculated based on measures of value, trust and number of ties to other agencies in the network. Relative connectivity is the perceived level (from a member) of the benefits received from a particular agency. Finally, redundancy is calculated based on the number of non-redundant ties; non-redundant ties refer to the number of connections between members who are not connected to any other member you are connected to (Varda et al., 2008a, 2008b). Non-redundant ties can be used to display connections to clusters or groups within the network. See Table 4 for full list of definitions for network measures.

Table 4.

Definitions and Implications of Network Measures

Measure	**Definition**	**Implications**
Ties	Network ties refer to links between members that can indicate the number or type of linkages between multiple pairs of nodes within a network (Bergenholtz & Waldstrom, 2011; Borgatti et al., 2013; Monge & Contractor, 2001). Ties can also be directed or un-directed, identifying which node is initiating interactions with the other as well as qualified informing the type of relationship that was exchanged (Borgatti et al., 2013; White, 2008).	-Can be used to assess overall network connectivity and can be useful in describing other network level characteristics regarding the nodes (Wasserman & Faust, 1994)
Degree	Degree is considered the simplest measure for prestige (e.g., number of nominators) (Krackhardt, 2003; Wasserman & Faust, 1994)	-Can be used as a proxy to identify the most engaged member in a collaboration network. That is, a member with high degree is expected to have popularity because many other members tend to establish a relationship with them. (Wasserman & Faust, 1994).
Density	Number of connections over the total possible number of connections within the whole network (Celentano, 2010; Valente et al., 2015)	- Used to measure integration of networks. That is, higher density indicated a higher degree of interorganizational collaboration among agencies in a network (Wasserman & Faust, 1994). - Identifies the most influential service sectors within the network (Provan et al., 2007; Valente, Palinkas, Czaja, Chu, et al., 2015; White, 2008).
Network Centrality	Degree to which an organization holds prestige, central position within the network (Celentano, 2010; Fredericks & Durland, 2005)	- Can be used to measure integration or coordination of services or resources (Nicaise et al., 2013).
Degree Centrality	In-degree centrality is the number of ties to an organization within the network. within the network. Out-degree centrality accounts for the number of ties a given node indicates with another node (Provan et al., 2007)	- In-degree informs the popularity and prestige of an organization, - Out-degree informs the expansiveness or influence of a particular node
Betweenness Centrality	Extent to which a node is connected directly or indirectly to others within the network with the shortest distance (Celentano, 2010; Neal & Neal, 2017; Provan et al., 2007; Valente, Palinkas, Czaja, Kar-Hai, et al., 2015)	- Can be used to identify strategic importance of nodes as main communicators or gateway keepers
Closeness Centrality	How close a node is to other nodes within a network (Wasserman & Faust, 1994)	- Identifies the average distance of each node from one another
Clustering coefficient	Clustering coefficient is a measure that can detail to what extent nodes (e.g., partners) in a network tend to cluster together (Valente et al., 2015; Wasserman & Faust, 1994).	-Can be used for more advanced statistical analysis to identify power structures in governance of a network by using subgroups analysis (or cliques) as well as the centralization of the overall network (Wasserman & Faust, 1994)

Table 4. (cont'd)

Triads	Triads refer to a subset of three or more actors and all possible ties between three or more actors (Wasserman & Faust, 1994). Number of triads in a network is an indicator for the network's likelihood of transitivity.	Triads carry important implications for determining quality of ties and the extent of weak ties (Wasserman & Faust, 1994). That is, networks with a high number of triads can be an indicator of cohesive power among those nodes (Granovetter, 1973).
Degree Assortativity	Degree assortativity refers to the tendency of nodes to connect with other nodes with similar characteristics (e.g., "birds of a feather flock together"); whereas, disassortativity refers to the tendency of nodes to mix and connect with other nodes that may not share their high number of degree.	Depending on the overall network and function of that network, degree assortativity can inform the extent of homogeneity of established relationships (Wasserman & Faust, 1994).
Diameter	Diameter refers to the average path length to get across others in a specific network graph.	A network's diameter can inform the speed in which information or other resources are shared across all other members in a bounded network (Wasserman & Faust, 1994).

Level of collaborative activities was measured using a four-level continuum, ranging from lower to higher levels of collaboration (Varda et al., 2008a, 2008b). Each agency participant in the CAP was asked to report the nature of activities carried out in their established relationships with other agencies. The survey provided participants with a table defining each level of activity; activities included: (1) general awareness; (2) cooperative activities involving the exchange of information, attending meetings together, informing other programs of available services; (3) coordinated activities which includes cooperative activities in addition to exchange of resources/service delivery and coordinated planning to implement client referrals, data sharing, or training; and (4) integrated activities which included cooperative and coordinated activities with the addition of shared funding, join program development, combined services, shared accountability or shared decision-making.

For time-point 2, two survey items were added to the PARTNER Tool survey that were specific to COVID-19 activities. Through observations and memos, one item was created to ask participants what types of activities they had engaged in the collaboration that moved toward health equity goals, including options related to webinars, creating products, updating websites

for testing sites, and so on. A second item was created to ask participants about what they gained from being involved with a collaboration throughout the pandemic. See Table 5 for more information on adapted items.

Table 5.

Adapted Items for PARTNER Tool Survey

Items	Scale
CAP Survey	Two items with multiple responses for facilitators and hinderances
DPQ	One item with multiple responses for motivations to participate
Demographics	Agency/institutional affiliation, (2) agency role, (3) duration of time involved with CAP, (4) organizational contributions; (5) type of partner
Perceived CAP Goals	One item with multiple response options, then another item with a single choice indicating the most important contribution
Perceived CAP Success	Likert Type Scale (1-5)
Trust	3 indices using Likert Type Scale (1-4) (a) reliable; (b) mission congruence; (c) open to discussion
Perceived Value	3 indices using Likert Type Scale (1-4) (a) power/influence; (b) level of involvement; (c) resource contribution
Network measures	*Whole network* Network density, centralization *Node level* degree centrality, closeness centrality, connectivity, quality of ties (frequency and level of activity)

The metrics used in the PARTNER Tool are well-known, validated social network metrics developed by experts and a series of interviews with end-users, consensus procedures around appropriate scales and metrics (Varda et al., 2008b; Varda & Sprong, 2020). However, the reliability of the survey used in the current study was not analyzed based on recommendations regarding reliability analysis with small sample sizes below 30 (Samuels, 2015). The entire survey took an estimated total of 15 minutes or less to complete. For a full description of metrics used in the PARTNER Tool, please see Appendix II.

Archival Data

Participant attendance sheets completed at the Convening and other existing archival data collected through the consortium were used to contextualize the CAP. These artifacts helped determine level of participation among partnering agencies. Tangible products related to the

work of the CAP members were explored to determine the extent to which partners collaborated outside of the CAP. This aligns with prior studies utilizing the number of products created by partnership members and related to the work of the overall CAP as an indicator for partnership effectiveness (Brookman-Frazee et al., 2012). The researcher reviewed meeting memos for monthly core leader meetings specific to the CAP, observed webinars where many CAP partners collaborated with another research center to disseminate information related to COVID-19, and observed a virtual conference where CAP partners presented as speakers.

Data Analysis Plan

Social Network Analysis (SNA)

The CAP was assessed at two time-points one year apart (January 2020, January 2021) using social network analysis with the unit of analysis at the organizational level and whole network level. Network analyses can be applied or basic (Borgatti et al., 2009). Basic network analyses seek to generate a theory of a particular phenomenon, using correlational or multivariate statistics to describe variance of factors as described by the function of other variables. Applied network analysis calculates metrics to describe the overall structure of the network and to demonstrate aspects of an organization's position (e.g., influence, trust) within the network. For the current study, applied network analysis was used to assess the overall structure of the CAP network in January 2020 and in January 2021. Once all quantitative data had been collected, basic SNA using the PARTNER Tool Platform was used to identify any significant relationships between network metrics and CAP characteristics.

Results from the applied SNA created visual sociograms to depict the nodes, representing partnered agencies, and network ties, conveying the links between multiple pairs of nodes within the network (Bergenholtz & Waldstrom, 2011; Borgatti et al., 2013; Monge & Contractor, 2001).

Sociograms are graph illustrations conveying the "social network as a model of a social system consisting of a set of social actors and the ties between them" (Wasserman & Faust, 1994, p. 93). Much like descriptive statistics, sociograms can illustrate the structural properties of the CAP, allowing for an overview on how agencies within the network are interacting, if there is a clique or cluster of groups working together, where interactions are predominantly occurring, and how organizational attributes (e.g., type of agency, duration in CAP) are related to a certain number of ties.

The PARTNER Tool Platform also allowed for visualizations of subgroups and other structural characteristics, similar to the visualization techniques demonstrated in UCINET, NetDraw and R. Using this, multiple sociograms were created to allow for the computation of powerful and validated network metrics (Varda et al., 2008a, 2008b). Calculated values from this SNA included Whole Network Overall Value Score, Whole Network Overall Trust Score, Individual Overall Value Score, Individual Power/Influence Score, Individual Level of Involvement Score, Individual Resource Contribution Score, Individual Overall Trust Score, Individual Mission Congruence Score, and Individual Open to Discussion Score. Additional descriptive statistics, including mean, standard deviations, non-parametric tests (or equivalent), and correlational analyses were used to explore the quantitative data.

Strategies for Missing SNA Data

Data missing from nonresponse is common when collecting longitudinal social network data through surveys and is no different than those found in cross-sectional studies (Huisman, 2014; Marcum et al., 2012). However, network data is generally susceptible to missingness from non-respondents (Provan et al., 2005). To date, there are not many strategies for best practices to handle missing data in network studies but Adams (2020) claims that the best approach "relies

on the specific solutions that have produced the best results in the context most closely aligned with your research interests" (p. 85). One of the best solutions to missing network data is to focus on the data collection phase, building relationships with community partners as an attempt to increase participation rates with genuine community engagement (Potterat et al., 2004). Given that this was a community-based research project, this suggestion was prioritized as indicated in the Procedures section above (specifically see Recruitment, above). The researcher planned to attend activities affiliated with the CAP to build rapport as an effort to reduce missingness from nonresponse. Many opportunities were limited due to the impacts from the pandemic in 2020.

To overcome challenges to response rates and missingness of whole network data, every effort to increase response rates from key representatives were carried out, including follow-up phone calls, personalized emails, increasing incentives, and offering the option to complete a paper survey. Additional response rate strategies, such as tailoring messages, frequency of follow-up reminders, and referrals from a CAP leader were used because such strategies have demonstrated higher survey completion in prior healthcare related studies (Edwards et al., 2009). Of note, these approaches work best when there is a small number of missing network members and have resulted in response rates of up to 90% in previous network studies (Provan et al., 2005). Moreover, the following were considered for missingness data: (1) If a participant did not complete the survey, some network ties were replaced using undirected ties reported from other agencies in the network to indicate that a relationship exists; (2) any subscale with less than 75% completed was counted as missing data ("9999"); and (3) if demographic data was missing (e.g., job title at the agency, duration of time involved with CAP, etc.), information from archival records and discussions with the CAP Core leaders were used to collect details.

Phase 2: Qualitative Phase

Sample

The sample for the qualitative phase of the study included all agencies participating in the CAP. All key representatives who participated in the quantitative PARTNER Tool survey were invited to participate in a semi-structured qualitative interview. Given the constraints from the COVID-19 pandemic on community-based agencies, community partners were not recruited at time-point 1 to minimize their burdens and acknowledge the circumstances. Instead, three CAP Core leaders (1 community PI and 2 academic co-PIs) were interviewed to collect information on the mission, leadership structure, and any CAP changes in response to partner's existing needs throughout the pandemic. At time-point 2, all community and academic partners were invited to participate in the interview. Using purposeful sampling, the project aimed to recruit at least 50% of the partners from each of the partnership categories (e.g., 50% or more of academic partners, 50% or more of local and national CBO partners, and 50% or more of policymakers).

Recruitment

All respondents who participated in the quantitative portion of the study were contacted by email and telephone at the beginning of the qualitative phase of the study. Recruitment for interviews began concurrently with recruitment for the surveys. In emails directed to participants, the researcher described the study's purpose and aims as well as their previous participation in the quantitative phase of the study. Participants were invited to schedule their interview using a Calendly link that was provided in the email. At time-point 1, participants were provided a $15 Amazon gift card as an incentive for their participation in the interview. At time-point 2, participants were provided with a $50 Visa gift card for participating in the interview.

Qualitative Data Collection Procedures

All interviews were scheduled using Calendly to find a time convenient for each participant's schedule. All interviews were completed by the researcher who had significant graduate and professional training in qualitative techniques, or a graduate assistant affiliated with the DISC core. Prior to the date of the interview, the researcher and intern contacted each participant to confirm their appointment and address any other concerns regarding the interview process. All interviews occurred over zoom using a HIPPA compliant platform and lasted up to 30 minutes. All information was kept confidential; identifiable names were not be attached to any documents outside of the protected server that has assigned ID codes. If names were discussed within the interviews, this information was censored within the transcripts. Of note, this approach was applied for both time-point 1 and time-point 2, but recruitment for time-point 1 was paused. This approach was applied again for recruitment at time-point 2.

Qualitative interview techniques grounded in best practices and prior literature (i.e., clarification questions, summarizing statements, etc.) were utilized to assure quality data and procedures (Bernard, 2006; Roulston, 2014). Before starting the interview process with participants, the researcher reviewed the consent form, emphasizing details on the aim of the research and procedures, participants' rights to withdraw from the study and any harm or benefits affiliated with the study. After reviewing these details, all key representatives were asked to provide additional verbal consent before starting the interview. If at any point during the interview, the participant no longer wanted to participate, the interview would be stopped, and participants would be thanked for their time.

Measures

Semi-Structured Individual Interviews. The quantitative data analyses informed the development of the semi-structured, individual interview. The initial interview protocol was developed to serve as a guide for the final questions that would be revised based on findings from the analyzed quantitative data (see Appendix III). The interview protocol aimed to elicit: (a) perspectives on the collaboration process with the CAP, (b) barriers and facilitators to the CAP efforts, (c) motivations for joining the CAP, (d) expectations of CAP outcomes, and (e) suggestions for improving the partnership. Modifications to the protocol were made to assess the impact of COVID-19 on the CAP from the perspective of CAP Core leaders. At time-point 1, leaders were asked broadly about the leadership structure, decision-making processes related to the CAP. Then, leaders were asked specifically about the changes made to the CAP as a direct result from COVID-19. At the end of the interview, leaders were asked to share any recommendations to maintain partnership efforts during a public health crisis (See Appendix IV).

Qualitative Data Analysis

Content Analysis. Qualitative data was analyzed using directed content analysis, a widely used, flexible qualitative research technique (Bernard, 2006; Hsieh & Shannon, 2005). Content analysis has become more prevalent in health-related research, but can be applied in a variety of disciplines and fields. Direct content analysis is considered "mostly" a deductive approach, but can be used with iterative approaches for more inductive coding procedures (Bernard, 2006). The approach was primarily used to analyze text data, which included transcriptions of interview data. Essentially, text data was coded to create themes that reveal underlying patterns or meanings (Hsieh & Shannon, 2005; Vaismoradi & Snelgrove, 2019).

To initiate the directed content analysis, the researcher created *a priori* themes derived from the existing CAP literature, exploratory research questions for the project, and quantitative findings from the first data collection phase of the project. Themes were developed with a coding schema that was used for coding all transcripts. Additional themes were added as they appeared salient throughout the analytical phase of the study, following an iterative constant comparison approach (Ryan & Bernard, 2003; Willms et al., 1990). The ongoing iteration of themes is a systematic approach that allowed for the emergence of new themes and subthemes as they surfaced from the interviews (Bernard, 2006; Willms et al., 1990). Segments of the texts, ranging from sentences to paragraphs, were assigned specific codes to consolidate interview data into analyzable units (Hsieh & Shannon, 2005; Roulston, 2014; Ryan & Bernard, 2003). Three coders, including the researcher and two undergraduate interns, identified emergent themes by the extent of their salience within the interview. Frequency of codes discussed within and across interviews constituted an emergent theme. Codes were quantized to present ever-coded (e.g., the number of transcripts that had the code assigned ever) and frequency (e.g., the number of times the code was assigned throughout all of the transcripts) counts, which provided additional data to support the salience of the emergent themes (Bernard, 2006; Hsieh & Shannon, 2005). All interview transcripts were entered, coded, and analyzed in MAXQDA.

Qualitative data saturation was determined at the data collection stage and achieved with procedures based on previous work (Saunders et al., 2018). Once interviews were completed and transcribed in Rev Speech to Text Services, two coders analyzed the interview data by identifying patterns and emergent themes. If data collected in the interviews began to show redundancy, then it was expected that data saturation had been reached (Saunders et al., 2018). If the two coders agreed that the comments in the interview data were showing repetition, then data

saturation was reached. A final consensus meeting determined the decision about whether any "new information" was being generated and to determine the degree to which identified codes or themes were represented in the data that had already been collected (Saunders et al., 2018).

Training and Procedures. To prepare data for qualitative analysis, all interviews were transcribed using Rev transcription services and de-identified to assure the confidentiality of participants. To assure quality checks, one intern reviewed the transcripts to remove identifiable information, and then another intern reviewed the transcripts again to assure quality of the transcription adhered to the audio recordings. Prior to coding, the coding team (researcher and 2 project interns) reviewed the initial coding schema for clarity, definitions, and examples from the collection of transcripts. Both coders practiced coding procedures with the coding schema and 2 transcripts chosen randomly. A consensus procedure was used to resolve all discrepancies and address any other confusion with the coding schema. Once consensus was reached, the coders began analyzing the data for analysis. All nine transcripts were double coded; coders independently coded each individual transcript and then met to discuss discrepancies using consensus meetings.

Integration of QUAN + QUAL. *Convergence* refers to the process of bridging the quantitative and qualitative data strands to explain the phenomenon of interest (Palinkas et al., 2019; Plano Clark et al., 2015). Given the impacts from the COVID-19 pandemic on the CAP, integration of data only occurred at time-point 2. Phase 1 QUAN results were converged with the Phase 2 QUAL data on a case-by-case basis (intra-case analysis) to allow for inter-case analysis (Pluye et al., 2018). Mixing methods demonstrated the salience of themes related to barriers and facilitators, along with motivation and perspectives from partners regarding the CAP. The convergence of cases (e.g., specific organizations) and their affiliated QUAL and QUAN data

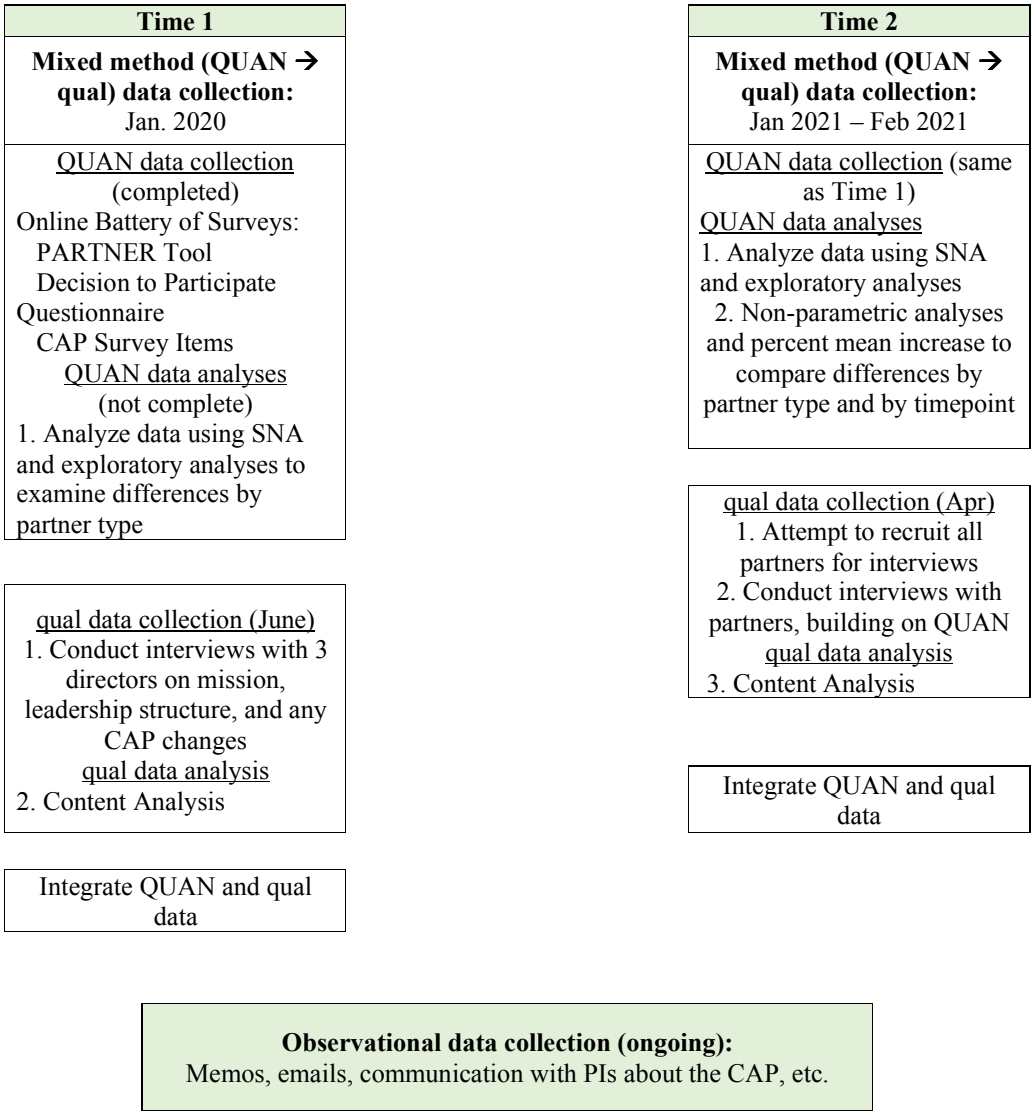
(Guetterman et al., 2015; Ivankova et al., 2006; Plano Clark et al., 2015) are illustrated and detailed in the discussion chapter. Of note, data strands at time-point 1 were analyzed separately because qualitative data collection from partners was ceased due to strains from COVID-19.

Data Management Procedures

One of the challenges in case study design is managing data and analyzing data from multiple and diverse sources (Lalor et al., 2013). A section on data management procedures has been included to demonstrate consideration to these challenges and to convey how data was protected for confidentiality. To store and manage multiple sources of data collection, a folder was created on the password protected server managed through MSU's Department of Psychology. Memos of data collection to confirm sources, process, and decision-making procedures were also created and stored safely. Only research personnel specific to this project had access to any of this data via use of secure password protected server, MSU SharePoint. Data for this project will be stored for three years after the project is completed on a password protected backup disc that is only accessible to the researcher and stored in a lockbox.

Figure 2.

Dissertation Project Procedures



CHAPTER 3: RESULTS

Results are organized by quantitative and qualitative data phases and by research questions proposed in the dissertation revision amendment. The quantitative data phase includes results on participants, facilitating and hindering factors of CAPs, network outcomes, perceived success, and motivating factors across two-time points. The qualitative data phase includes findings on a subset of participants, experiences with CAP collaborations, changes to the CAP in response to COVID-19, and recommendations for improving collaboration efforts in the future.

Phase 1: Quantitative Data

Participants

A total of 23 out of 27 (85%) quantitative survey responses were received at time-point 1. Twenty respondents represented local, state and national level community partners and three respondents represented academic partners. All community partners were key leaders in public health agencies, representing agencies providing social services (n = 3), direct health services (n = 7), and non-profit agencies (n = 10) focused on providing Flint community members with resources. Participants who did not complete the network survey at time-point 1 included two policymakers, one academic partner, and one community partner. Of note, the two policymakers were not recruited for the next assessment, given their lack of engagement with the CAP, regulations restricting participation in research, and in accordance with a recommendation by a former dissertation committee member. Fifty-five percent of community partners held mutually exclusive roles of chief executive directors (CEOs), 25% were executive directors, 15% were board members, and 5% were program coordinators at their affiliated organization. Academic partners reported roles as faculty (50%), ethics review board administrator (25%) or research specialist (25%). At timepoint 2, a total of 16 (out of 25) participants completed the network

survey, resulting in a response rate of 64%. Of note, for whole network studies, a response rate from 50% to 70% is deemed acceptable and unlikely to impact results of exploratory analyses (Grosser et al., 2010; Kossinets, 2006; Retrum et al., 2013). Participants who responded at time-point 1 but did not complete the network survey at time-point 2 included two academic partners and six community partners. Information regarding role and duration of time with the CAP were imputed manually with ongoing discussions with the Co-PI and archival records indicating participant information.

At time-point 1, CAP partners' involvement with the CAP averaged at 23.43 months (*SD* = 13.356) with a range of 0 – 40 months (e.g., since the CAP began in 2016). At time-point 2, partners' involvement with the CAP averaged 35 months (*SD* = 13.72) with a range of 12 – 52 months. Further exploration of these rates by partner type revealed that academic partners reported slightly longer duration with the CAP than community partners (Table 6).

Table 6.

Overview of Participants by Partner Type and Time

	T1		T2	
	Sample *n* (%)	**Duration of time with FCHES (in months)**	**Sample *n* (%)**	**Duration of time with FCHES (in months)**
All partners	23 (85%)	*M* = 23.43 (*SD* = 13.358)	16 (64%)	*M* = 35.63 (*SD* = 13.72)
Academic	3 (75%)	*M* = 26 (*SD*=17.321)	2 (50%)	*M* = 41.50 *(SD* =15.78)
Community	20 (95%)	*M* = 23.05 (*SD*=13.185)	14 (67%)	*M* = 34.45 *(SD* =13.41)

Diagnostics and Missingness

Initial analyses of data examined central tendency of the distribution for each variable, spread and dispersion, outliers, missing data, comparisons between reported mean and trimmed mean, measurement properties (e.g., reliability), and any other issues for continuous variables (Huebner et al., 2018; Pallant, 2011). Diagnosis was carried out for the following continuous variables: NUM_Motivations, Perceived Success, SUM_Resources, SUM_Facilitators,

SUM_Hindering, SUM_Goals. For categorical variables, the variations of categories were examined to diagnose normality. Categorical variables included the following: Set_DPQ, Set_Facilitators, Set_ Hindering, Org Contributions, Set_CAP_Outcomes, Most_ImpContribution, Most_ImpCAPOutcome. At time-point 1, about 8% of the data was missing due to non-response; at time-point 2, 36% of the data was missing due to non-response. For continuous variables, inspections of diagnostics indicated that the mean and 5% trimmed mean were not extremely different, suggesting that extreme values did not have a strong influence (differences ranged from 0.1 to .23). Thus, all cases in the data file were retained. When inspected by partner type, results were similar, indicating little to no impact from extreme values. Of note, categories for categorical variables were not collapsed because of the exploratory nature of the current study and because integration of the two data strands did not require this as a requisite for analysis. Additionally, missing data was given a "9999" to filter out from the final frequency and count scores for all variables at time-point 1 (1 academic and 1 community) and at time-point 2 (2 academic and 7 community).

RQ1: What Factors Facilitate or Hinder the Development of CAPs Over Time?

Facilitators to Collaboration

To identify facilitating factors to CAP collaboration, data were analyzed using the CAP survey item at time-point 1 and time-point 2. Descriptive analyses were used to summarize frequencies of responses at both time-points (Table 7). Multiple response categories were created and aggregated by partner type (community, academic). At time-point 1, the majority of community partners endorsed factors related to having a good relationship between partners (65%), bringing together diverse stakeholders (50%) and good quality of leadership (40%) as facilitators to health equity collaborations through the CAP. The majority of academic partners, on the other hand,

endorsed factors related to exchanging information and knowledge (100%), having a shared vision, goals, and/or mission (66.7%), having well-structured meetings (66.7%), and good relationships between partners (66.7%).

Table 7.

Frequencies of Facilitating Factors by Partner Type and Time

Facilitating Factors	Community Partner (T1)	Community Partner (T2)	Academic Partner (T1)	Academic Partner (T2)
Respect among partners	35%	78.6%	33.3%	100%
Good relationships between partners	65%	64.3%	66.7%	100%
Positive community impact	30%	85.7%	0%	100%
Trust between partners	20%	85.7%	33.3%	100%
Mutual benefit for all partners	35%	71.4%	33.3%	100%
Clearly differentiated roles/functions of partners	10%	21.4%	0%	100%
Shared vision, goals, and/or mission	30%	92.9%	66.7%	100%
Well-structured meetings	5%	57.1%	66.7%	100%
Good initial selection of partners	20%	28.6%	33.3%	100%
Effective and/or frequent communication	0%	50%	33.3%	100%
Effective conflict resolution	5%	42.9%	0%	100%
Good quality of leadership	40%	64.3%	33.3%	100%
Bringing together diverse stakeholders	50%	78.6%	66.7%	100%
Exchanging info/knowledge	35%	64.3%	100%	100%
Sharing resources	10%	57.1%	33.3%	100%
Informal relationships created	5%	14.3%	0%	100%

A count score for the total number of facilitating factors was computed to examine differences by partner type. Community partners reported an average of 4 (*SD* = 2.66; *Md* = 3.50, range = 1-11, whereas academic partners reported an average of 6 facilitating factors (*SD* = 5.00; *Md* = 6, range = 1-11). Results from Independent Samples Mann Whitney U Test indicated that the distribution was roughly the same across both groups (Mann Whitney U = 22.50, $p > .05$, $\eta 2 = .02$, $d = 0.288$; Table 8).

At time-point 2, community partners most frequently endorsed shared vision, goals, and/or mission (92.9%), positive community impact (85.7%), and trust between partners (85.7%) as facilitating factors. Academic partners endorsed all categories for facilitating CAP collaborations. The same procedures were used to transform frequencies to count scores. Community partners reported an average of 9.57 facilitating factors (*SD* = 3.35; *Md* = 10, range = 5-15), whereas academic partners reported an average of 15.5 facilitating factors (*SD* = .71; *Md* = 15.5, range = 15-16). Independent Samples Mann Whitney U Test indicated significant differences in the distribution of scores across partner types (Mann Whitney U = 0.50, $p = 0.17$; $\eta 2 = .029$, $d = 1.27$). Thus, academic partners (Mean Rank = 15.25) reported a significantly higher number of facilitating factors than community partners (Mean Rank = 7.54) at time-point 2 (Table 8).

Table 8.

Mann-Whitney U Test Between Group Comparisons for Facilitating Factors

T1	**Community** (*n* = 20)				**Academic** (*n* = 3)				
	M Rank	***Md***	**Min**	**Max**	***M Rank***	***Md***	**Min**	**Max**	***p***
Facilitating Factors	11.63	3.5	1	11	14.5	6	1	11	.51
T2	**Community** (*n* = 14)				**Academic** (*n* = 2)				
	M Rank	***Md***	**Min**	**Max**	***M Rank***	***Md***	**Min**	**Max**	***p***
Facilitating Factors	7.54	10	5	15	15.25	15.5	15	16	.02

Hinderances to Collaboration

To identify hindering factors to CAP collaboration, data was analyzed using the hindrances to CAP survey item at time-points 1 and 2. Descriptive analyses were used to summarize frequencies of responses at both time-points (Table 9). Multiple response categories

were created and aggregated by partner type (community and academic). At time-point 1, both community and academic partners most frequently endorsed unclear roles and/or functions of partners (100% and 60%, respectively) and inconsistent partner participation or membership (100% and 25%, respectively), with 20% of community partners also reporting lack of common knowledge or shared terms between partners. A count score for the total number of hindering factors was computed to examine differences by partner type at each time-point. At time-point 1, community partners reported an average of 1.75 (*SD* = 1.52; *Md* = 1, range = 1-6), whereas academic partners reported an average of 3.33 hindering factors (*SD* = 1.53; *Md* = 3; range = 2-5). Results from Independent-Samples Mann-Whitney U Test indicated that the sample distributions were not the same between partners (Mann Whitney U = 8.50, $p = 0.05$; $\eta 2 = 0.17$, $d = 0.90$), suggesting that academics (Mean Rank = 19.17) reported a significantly higher number of hinderances to collaboration than community partners (Mean Rank = 10.93).

Table 9.

Frequencies of Hindering Factors by Partner Type and Time

Hindering Factors	Community Partner (T1)	Community Partner (T2)	Academic Partner (T1)	Academic Partner (T2)
Mistrust between partners	5%	71.4%	0%	50%
Poor or unequal decision-making	0%	57.1%	33.3%	50%
Lack of mutual benefit	0%	57.1%	33.3%	50%
Unclear roles and/or functions of partners	60%	64.3%	100%	100%
Excessive time commitment	5%	78.6%	0%	50%
High burden of activities/tasks	0%	42.9%	0%	50%
Differing expectations of partners	15%	64.3%	33.3%	50%
Inconsistent partner participation or membership	25%	35.7%	100%	100%
Excessive funding pressures or funding control struggles	0%	42.9%	0%	50%
Poor communication between partners	10%	78.6%	33.3%	100%
Lack of shared vision, goals, and/or mission	15%	57.1%	0%	50%
Lack of a common knowledge or shared terms between partners	20%	42.9%	0%	50%
Other: Common agenda to direct efforts	5%	7%	0%	0%
None of these	15%	0%	0%	0%

At time-point 2, community partners most frequently endorsed poor communication between partners (78.6%), excessive time commitment (78.6%), and mistrust between partners (71.4%) as hindering factors to CAP collaboration. All academic partners most frequently endorsed the same hindering factors as was endorsed at time-point 1 (i.e., inconsistent partner participation and unclear roles/functions; 100%, respectively) with the addition of poor communication between partners (100%). The same procedures were used to transform these frequencies into count scores. Community partners reported an average of 7 hindering factors (*SD* = 3.658; *Md* = 7, range = 1-12). Academic partners reported an average of 7.5 hindering factors (*SD* = 6.36; *Md* = 7.5, range = 3-12). Results from Independent-Samples Mann-Whitney

U Test indicated that the sample distributions were roughly the same between partners (Mann-Whitney U = 13.00, $p > .05$; $\eta 2 = .002$, $d = .079$; Table 10).

Table 10.

Mann-Whitney U Test Between Group Comparisons for Hindering Factor

T1	**Community** (n = 20)				**Academic** (n = 3)				
	M Rank	***Md***	**Min**	**Max**	***M Rank***	***Md***	**Min**	**Max**	***p***
Hindering Factors	10.93	1	1	6	19.17	3	2	5	0.05
	Community (n = 14)				**Academic** (n = 2)				
T2	***M Rank***	***Md***	**Min**	**Max**	***M Rank***	***Md***	**Min**	**Max**	***p***
Hindering Factors	8.43	7	1	12	9.00	7.50	3	12	0.93

RQ2: How do Network Outcomes Change from T1 to T2?

To answer the second research question, network data collected via the PARTNER Tool platform were analyzed to calculate network metrics using Python's NetworkX package (version 2.5). Other data related to the CAP network were analyzed using the PARTNER Tool to demonstrate the quality of interactions occurring within the network (e.g., level of involvement, trust, value, power/influence, mission congruence, and openness to discussion), communication in the network (e.g., level of collaboration, frequency of communication), and network outcomes (e.g., partner resource contributions).

Connectivity of Network Structure

Network level variables provide an overview of the connectivity of the network structure as a whole. Descriptive results of the CAP network included a network size of 1 with 27 nodes (e.g., partners) made up of 351 *potential* ties in the network (calculated as (total n(n-1)/2)). At time-point 1, there were 146 edges (existing ties in the CAP) and 128 edges at time-point 2. The

mean degree of the network was 11.2308 at time-point 1, indicating that on average partners reported about 11 ties with other partners in the network. At time-point 2, the mean degree of the network was 9.4815, indicating that on average partners reported about nine ties with other partners in the network.

Network level density (% of all possible ties in the network), and total percentage of value, power/influence, level of involvement, resource contribution, trust, mission congruence and openness to discussion of the network were calculated. Network density can be used to indicate the network's cohesion and informs the extent of collaboration (Celentano, 2010; Valente et al., 2015; Wasserman & Faust, 1994). At time-point 1, network density was calculated as 0.2707, indicating that about 27% of the network were collaborating out of all possible ties. About 79% of the network shared mission congruence with 79% of trust and openness to discussion. This indicates that a large percentage of organizations embedded in the network shared a sense of mission congruence, as well as trust and openness. Around 72% of the network was reported as having value with 77% of power/influence and 72% of involvement. Additionally, about 66% of the network were contributing resources to the CAP's collaboration efforts.

At time-point 2, network density was calculated as 0.2308, indicating that about 23% of all potential ties in the network were established. This shows slightly lower network density than time-point 1. However, qualities of ties in the network increased. About 81% of the network shared mission congruence with 81% of trust and 78% of openness to discussion. Around 81% of the network was reported as having value, indicating high value of partners in the CAP overall with 78% of power/influence and 82% of involvement. About 72% of the network were contributing resources to the CAP's collaboration efforts. See Table 11.

Table 11.

Overview of Network Level Connectivity at T1 and T2

	Density	Value	Power/ Influence	Level of involvement	Resource contribution	Trust	Mission Congruence	Open to discussion
T1	27.07 %	72.30 %	77.59%	72.4%	66.91%	79.6%	79.31%	79.89%
T2	23.08 %	78.39 %	79.94%	82.30%	72.93%	81.01 %	81.17%	78.70%

Additional SNA measures to describe the CAP network were computed as network diameter, degree assortativity (weighted and unweighted) and transitivity. Network diameter was 3 across both time-points, indicating that the longest shortest paths have a length of 3 edges (e.g., for anything to be disseminated across the network, it would only take 3 steps to get to all members). Degree assortativity was calculated as -0.22463 (weighted) at time-point 1 and -0.29206 (weighted) at time-point 2, indicating that agencies with a large degree of ties had a tendency to establish a relationship with agencies with low degree of ties. In other words, the network was disassortative at both time-points, suggesting that agencies with more collaborations tended to engage with agencies with less established collaborative ties (Newman, 2002). Transitivity measures the likelihood that nodes adjacent to one another are also connected and can be an indicator for the network's flow of information (Varda & Retrum, 2012). Measures for transitivity were calculated as 0.5522 at time-point 1 and 0.5875 at time-point 2. These results indicate that 55% to 58% of all triads possible were present in the CAP.

Node level variables were also calculated to provide an overview of the network's connectivity at the organizational level. Python NetworkX package was used to calculate degree, betweenness centrality, closeness centrality, and clustering coefficients for the undirected network, and in-degree centrality, out-degree centrality, and degree for the directed network. Directed network ties are considered reliable indicators of network activity (Leppin et al., 2018), but undirected network ties can also be particularly useful in identifying opportunities for growth

to improve community collaborations (Provan et al., 2005), particularly with small sample sizes (Brown et al., 2014). Given this, both versions of the network are presented below to broaden understanding of the CAP network structure at each time-point.

Undirected Social Network Analysis

Undirected networks refer to a symmetric network with ties self-identified from one agency to another agency, but the other agency does not confirm whether the tie exists (Provan et al., 2009; Wasserman & Faust, 1994). For the undirected network, network ties for nonresponding partners were imputed on the basis of other partners in the CAP (e.g., undirected ties). That is, if a partner indicated a relationship with another partner who did not respond to the survey; then this response was used to determine whether a relationship existed between partners (Bright et al., 2019; Petrescu-Prahova et al., 2015; Schoen et al., 2014). Excluding non-respondents can potentially present respondent bias (Honeycutt & Strong, 2012).

Measures of degree, clustering coefficients, betweenness centrality, and closeness centrality were weighted with quality of ties (frequency of communication) to incorporate the strength or weakness of ties into network scores (Granovetter, 1973). A weighted network measure implies that the ties reported from each partner have weights assigned to them (e.g., frequencies of communication). Weighted SNA measures can provide more descriptive details regarding collaboration ties and can be more robust than unweighted measures.

Table 12 shows the results from the time-point 1 network survey. Results indicate that AVE (78), NCAAHC (76), and CC-GHP (62) had the highest degree of ties, suggesting that they endorsed more collaborations than others in the CAP. AMC (12), NCHE (13), and NAACP (14) reported the lowest degree of ties. Metrics of betweenness centrality can be used to identify bridgers. Bridgers refer to nodes (e.g., partners) who are likely to be an important relaying point

to pass between one partner to the next (Freeman, 1979). The three highest rates of betweenness centrality were found for CBOP (0.28), GCHD (0.21), and LUFF (0.21), suggesting that these partners may be integral in accessing resources, information, or other opportunities for collaboration. In terms of closeness centrality, AMC (0.543), NAACP (0.555), and NCHE (0.568) were considered closest to other partners in the network (e.g., smaller number means shorter distance).

Table 12.

T1 Network Data for Undirected Graph (Weighted with Frequency of Ties)

Type	Partner	Degree	Clustering Coefficient	Betweenness centrality	Closeness centrality
Community	AMC	12	0.332832497	0.076923077	0.543478261
Community	AVE	78	0.242737281	0.107051282	0.892857143
Community	BBF	41	0.270333107	0.181645022	0.714285714
Community	CBOP	51	0.244079977	0.280351981	0.757575758
Community	CC-GHP	62	0.278205494	0.139662005	0.78125
Community	COFY	21	0.403301243	0.083333333	0.595238095
Community	FOHI	38	0.415628404	0.076923077	0.609756098
Community	GCBH	23	0.438993468	0.076923077	0.595238095
Community	GCHD	49	0.204242372	0.210361638	0.862068966
Community	GFHC	27	0.388704024	0.077435897	0.595238095
Community	GHS	57	0.241816975	0.097384615	0.757575758
Community	HCHN	32	0.319187594	0.128333333	0.657894737
Community	LP	25	0.487765889	0.076923077	0.581395349
Community	LUFF	18	0.24690018	0.208388611	0.625
Community	MCHWA	24	0.207167543	0.116153846	0.641025641
Community	MPHI	24	0.269451126	0.076923077	0.595238095
Community	NAACP	14	0.276297706	0.109692308	0.555555556
Community	NCAAHC	76	0.27098627	0.082153846	0.833333333
Community	NCHE	13	0.231139985	0.110920746	0.568181818
Community	PIHP	29	0.254164168	0.076923077	0.581395349
Community	WELLAIDS	16	0.260418975	0.138795205	0.595238095
Academic	UM	23	0.296495531	0.118518149	0.609756098
Academic	PCC	34	0.251174794	0.111741259	0.641025641
Academic	UMF	38	0.34231485	0.104232101	0.657894737
Academic	METHOD	0	0	0	0
Policymaker	SN	21	0.286556694	0.099230769	0.595238095
Policymaker	DK	24	0.298112615	0.094307692	0.609756098

Table 13 shows the results from the time-point 2 network survey. Results indicate that NCAAHC (82), CC-GHP (75), GFHC (71) reported the highest degree, suggesting that they endorsed a higher number of collaborations than others in the CAP. NAACP (3), AVE (5), and

AMC (5) reported the lowest degree scores. The three highest rates of betweenness centrality were calculated for GCHD (0.305), MPHI (0.253), and CBOP (0.204), suggesting that these partners may be bridgers for accessing resources, information, or other opportunities for collaboration. In terms of closeness centrality, AVE (0.426), AMC (0.433), and NAACP (0.448) were considered closest to other partners in the network (e.g., smaller number means shorter distance).

Table 13.

T2 Network Data for Undirected Graph (Weighted with Frequency of Ties)

Type	Partner	Degree	Clustering Coefficient	Betweenness Centrality	Closeness Centrality
Community	AMC	5	0.119690816	0.097747931	0.433333333
Community	AVE	5	0	0.074074074	0.426229508
Community	BBF	11	0.746900791	0.074074074	0.456140351
Community	CBOP	60	0.253511384	0.204063221	0.722222222
Community	CC-GHP	75	0.354598571	0.080721747	0.764705882
Community	COFY	12	0.460503939	0.074074074	0.509803922
Community	FOHI	34	0.469792933	0.085022385	0.619047619
Community	GCBH	30	0.348616619	0.140075973	0.634146341
Community	GCHD	63	0.264198017	0.305304572	0.8125
Community	GFHC	71	0.311863714	0.090035273	0.787878788
Community	GHS	63	0.349035108	0.141120608	0.702702703
Community	HCHN	44	0.583544808	0.074074074	0.619047619
Community	LP	13	0.692875608	0.074074074	0.472727273
Community	LUFF	27	0.458077551	0.074074074	0.553191489
Community	MCHWA	35	0.4931803	0.086894587	0.604651163
Community	MPHI	27	0.304678466	0.25365622	0.619047619
Community	NAACP	3	0	0.074074074	0.448275862
Community	NCAAHC	82	0.327348617	0.149810066	0.787878788
Community	NCHE	13	0.535680404	0.074074074	0.509803922
Community	PIHP	24	0.334997987	0.074074074	0.52
Community	WELLAIDS	26	0.418589649	0.082173382	0.565217391
Academic	METHOD	22	0.475780038	0.082146249	0.553191489
Academic	PCC	48	0.393305237	0.095136345	0.666666667
Academic	UM	52	0.317066313	0.162657713	0.722222222
Academic	UMF	41	0.397207302	0.078347578	0.619047619
Policymaker	DK	17	0.627380636	0.074074074	0.52
Policymaker	SN	19	0.477660287	0.074074074	0.530612245

Directed Network Social Network Analysis

Using the PARTNER Tool, calculations were computed for node level measures in a directed network at each time-point. Node-level measures included degree centrality (the degree

to which an organization holds prestige or central position within the network), in-degree centrality (number of incoming ties from other collaborators) and out-degree centrality (number of self-reported outgoing ties). These outputs were used to identify the most centralized groups of collaborators in the network. At time-point 1, the most centralized partners included AVE (84.62%), GCHD (80.77%), and NCAAHC (76.92%). The least centralized partner included AMC (15.38%) and METHOD (0%). Partners with the highest in-degree centrality included GHP (13), HCHN (12), GCHD (11), UMF (11), and PCC (10), and included 3 community partners and two academic partners, respectively. In other words, these five partners were most frequently reported by other partners as collaborators. Partners with the highest rate of out-degree centrality included AVE (22), NCAAHC (19), GCHD (18). Given the position of GCHD, these findings indicate that they might be a key community partner in the CAP's collaborations overall. See Table 14.

Table 14.

PARTNER Tool Output for Node Level Measures: Directed Network at T1

Partner	Degree centrality	In Degree Centrality (Max 27)	Out-Degree Centrality (Max 27)
AMC	15.38%	1	3
AVE	84.62%	2	22
BBF	57.69%	2	15
CBOP	65.38%	8	14
CC-GHP	65.38%	9	12
COFY	30.77%	6	3
DK	30.77%	9	0
FOHI	34.62%	9	3
GCBH	30.77%	6	4
GCHD	80.77%	11	18
GFHC	30.77%	8	0
GHS	69.23%	13	14
HCHN	46.15%	12	0
LP	29.92%	2	6
LUFF	38.46%	5	7
MCHWA	42.31%	4	10
METHOD	0.00%	0	0
MPHI	30.77%	7	1
NAACP	23.08%	3	3
NCAAHC	76.92%	4	19
NCHE	23.08%	4	2
PCC	42.31%	10	2
PIHP	30.77%	5	5
SN	30.77%	9	0
UM	34.62%	9	0
UMF	46.15%	11	5
WellAIDS	31%	6	6

At time-point 2 (Table 15), the most centralized partners included GCHD (76.92%), GFHC (73.08%), and NCAAHC (73.08%). The least centralized partners included BBF (7.69%), AVE (3.85%), and NAACP (3.85%). Partners with the highest in-degree centrality included GFHC (12), GCHD (11), GHP (11), UMF (11), comprised of three community partners and one academic partner, respectively. Partners with the highest rate of out-degree centrality included NCAAHC (19), GCHD (19), and GHP (18). Given the position of GCHD, these results suggest that they continued to be a key community partner in the CAP's collaborations at time-point 2.

Table 15.

PARTNER Tool Output for Node Level Measures: Directed Network at T2

Partner	Degree centrality	In Degree Centrality (Max 27)	Out-Degree Centrality (Max 27)
GCHD	76.92%	11	19
NCAAHC	73.08%	2	19
GFHC	73.08%	12	16
CC-GHP	69.23%	11	18
GHS	61.54%	8	13
UM	61.54%	8	12
CBOP	61.54%	9	11
PCC	50%	9	10
GCBH	42.31%	4	9
MPHI	42.31%	7	6
UMF	42.31%	11	0
MCHWA	38.46%	6	7
FOHI	38.46%	10	0
HCHN	38.46%	10	0
WellAIDS	30.77%	6	5
LUFF	26.92%	3	7
PIHP	26.92%	4	5
METHOD	23.08%	6	0
DK	19.23%	5	0
SN	19.23%	5	0
COFY	15.38%	4	0
NCHE	15.38%	4	0
LP	11.54%	1	3
AMC	11.54%	2	2
BBF	7.69%	2	0
AVE	3.85%	1	0
NAACP	3.85%	1	0

Communication

Level of Collaboration (Joint Work)

To examine the level of collaborative activities occurring within the CAP, descriptive statistics were used to generate frequencies of categories endorsed at time-points 1 and 2 (Table 16). Categories increase in level of collaboration from aware (lowest) to integrated (highest). At T1, the most frequently reported levels of collaboration included awareness (29.5%), followed by integrated (24.2%) and cooperative (21.6%). The least endorsed level of collaboration activities was coordinated (15.2%), with the remaining 9.5% categorized as “none” due to no

response. At T2, the most frequently reported level of collaboration included cooperative (35.2%) and integrated (30.2%). The least endorsed level of collaboration was reported as awareness (14.8%), coordinated (17.9%), with 1% categorized as "none." Frequencies in level of collaboration activities at time-point 1 and at time-point 2 are also presented. Percent changes in reported levels of collaboration were calculated to demonstrate any patterns or fluctuations in the network over time. Percent change calculations indicated increases in reported levels of cooperative (39.02%) and integrated activities (6.52%), as well as decrease in lower levels of collaboration, such as awareness (- 57.14%) and none (-88.88%). Frequencies reported for coordinated activities showed no change from time-point 1 to time-point 2.

Table 16.

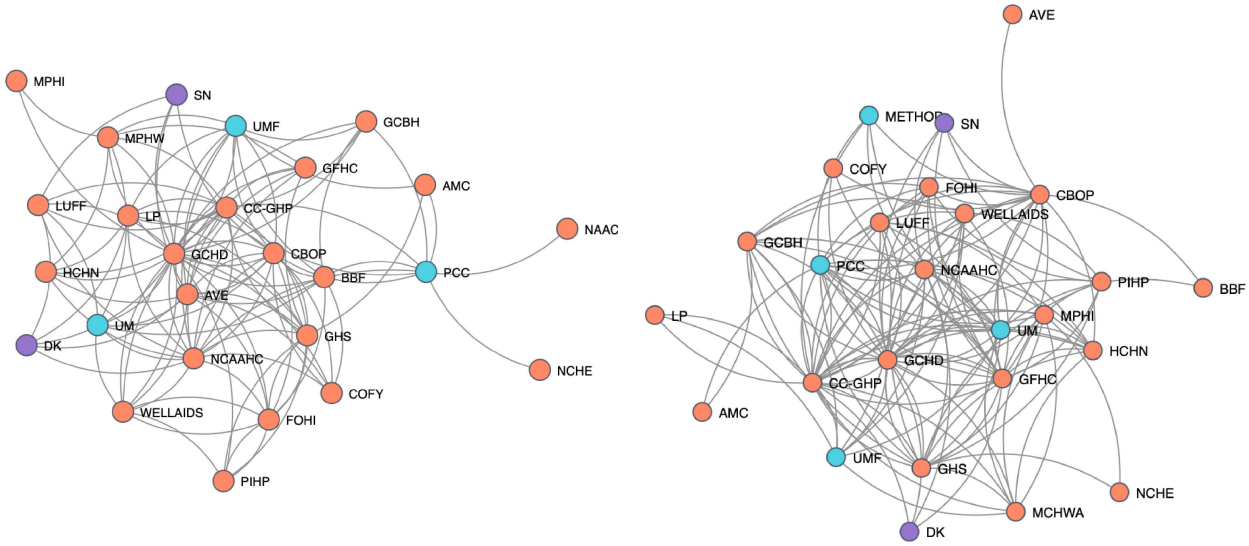
Change in Level of Collaboration Activities

	Time-Point 1		**Time-Point 2**		**Difference**	**% Change**
Level of Collaboration	*n*	*%*	*n*	*%*		
None (1)	18	9.5%	2	1.23%	-16	- 88.88%
Aware (2)	56	29.5%	24	14.8%	-32	- 57.14%
Cooperative (3)	41	21.6%	57	35.2%	+16	39.02%
Coordinated (4)	29	15.2%	29	17.9%	0	0%
Integrated (5)	46	24.2%	49	30.2%	+3	6.52

A sociogram illustrating network ties was created for each level of collaboration (e.g., aware network, cooperative network, coordinated network, and integrated network) for an overview of observations at time-point 1 and at time-point 2. To summarize results concisely, the sociogram for cooperative, coordinated, and integrated were aggregated to create a network for "at least cooperative levels of collaboration." Blue colored nodes represent academic partners, orange-colored nodes represent community partners, and purple-colored nodes represent policymakers. See Figures 3 and 4.

Figure 3.

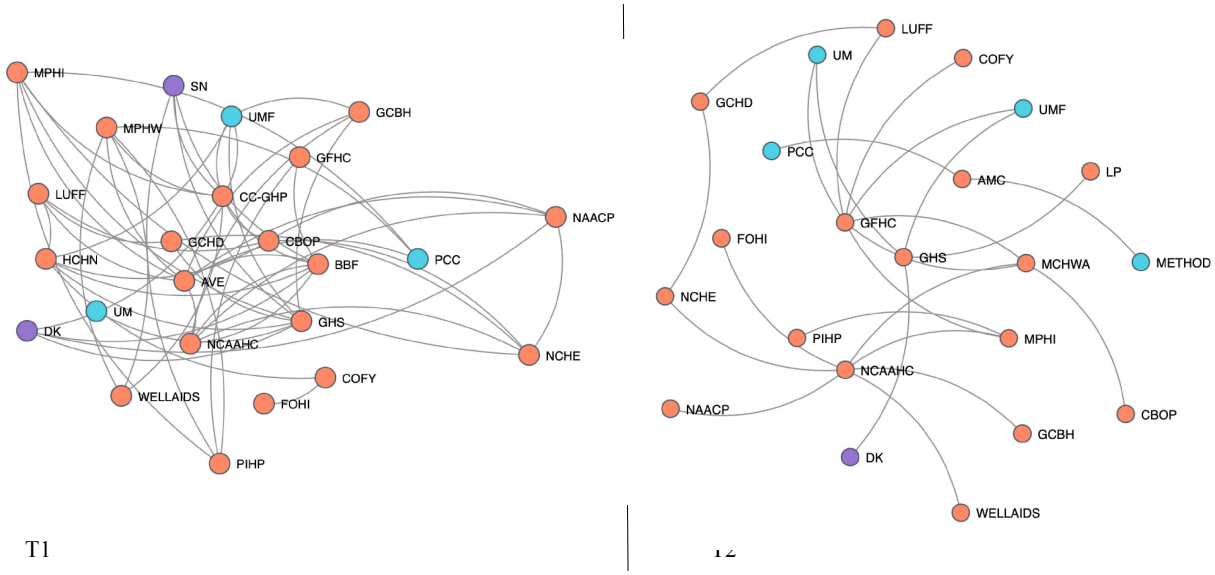
Sociogram of "At Least Cooperative" Collaborations



T1 T2

Figure 4.

Sociogram of "Awareness" Level of Collaborations



T1

Frequency of Communication

To examine frequencies of collaboration in the CAP, descriptive statistics were used to generate frequencies of communication using categories generated from the PARTNER Tool at time-point 1 and again at time-point 2. At time-point 1, the majority of partners reported monthly communication (25%), with the remaining reporting never (interacting only on issues outside of the collaborative; 23.7%), quarterly (21.6%), and yearly (19.5%). Of note, the least endorsed levels of communication included daily (4.2%) and weekly (5.8%) forms of communication with other partners in the CAP. At time-point 2, over 20% of partners reported weekly (27.1%), quarterly (24%), yearly (22%), and monthly (21.6%) frequencies of communication. To observe differences between time-points, a point change was calculated to illustrate any growth scores in communication frequency levels over time. These procedures followed existing studies on percent change increase in network metrics (Bright et al., 2017). Results show that there were increases in weekly (300%) and daily (12.5%) forms of communication, as well as a decrease in the lowest level of communication (e.g., none/unrelated to CAP) (Table 17).

Table 17.

Change in Frequency of Communication

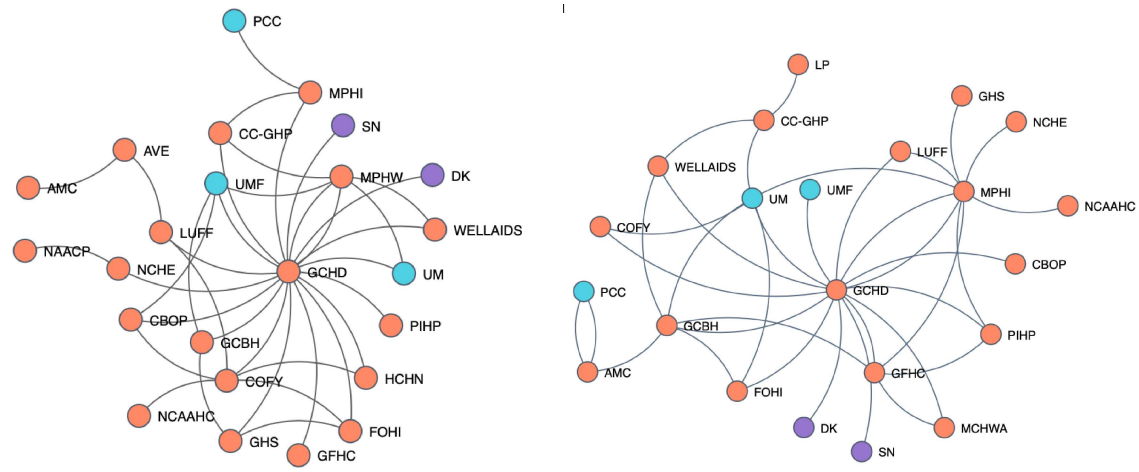
	Time-Point 1 (Spring 2020)		**Time-Point 2 (Winter 2020)**			
Frequency of Collaboration	*n*	*%*	*n*	*%*	**Difference**	**% change**
Never (1)	45	23.7%	2	1%	-43	-95.55%
Once a year or less (2)	37	19.5%	36	22%	-1	-2.7%
About once a quarter (3)	41	21.6%	39	24%	-2	-4.8%
About once a month (4)	48	25.2%	35	21.6%	-13	-27%
Every week (5)	11	5.8%	44	27.1%	+33	300%
Every day (6)	8	4.2%	7	4.3%	-1	12.5%

A sociogram illustrating network ties was created for each frequency of communication (e.g., yearly, quarterly, monthly, weekly, and daily) for time-point 1 and time-point 2. For conciseness, every week and every day were aggregated to create a network for "at least weekly"

levels of communication. Once a month and once a quarter were aggregated to create a network for "at least monthly." See Figures 5, 6, and 7.

Figure 5.

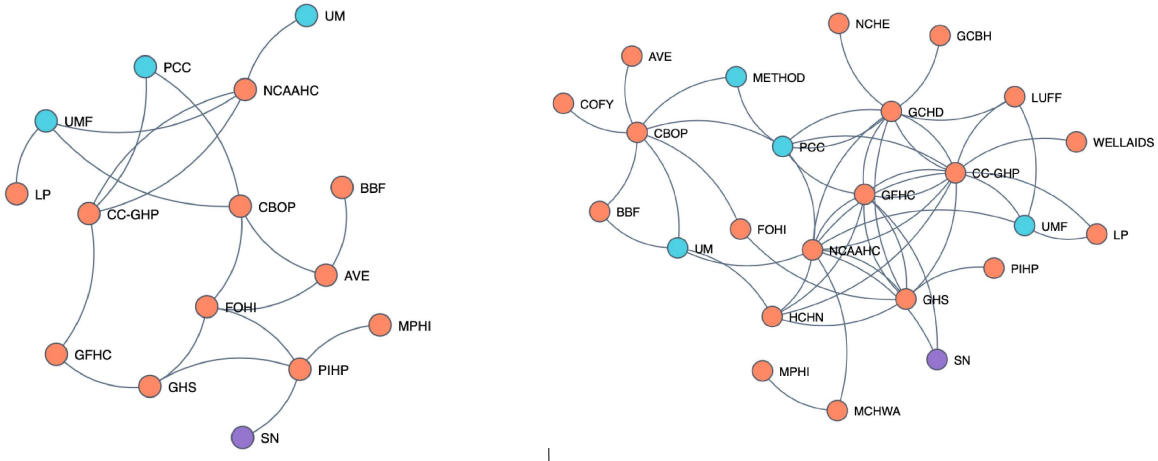
Sociogram of Yearly Levels of Communication



T1 | T2

Figure 6.

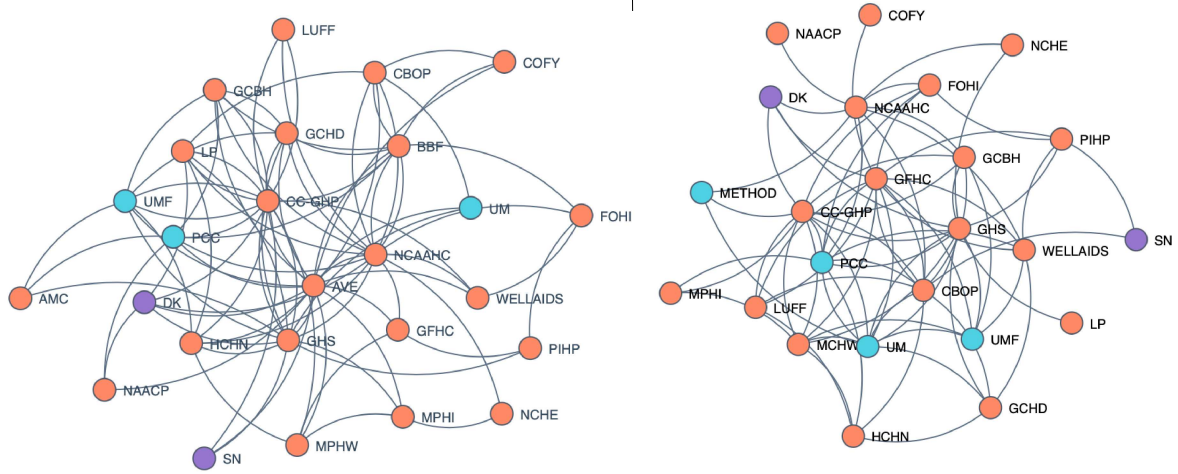
Sociogram of at Least Once a Week Levels of Communication



T1 | T2

Figure 7.

Sociogram of at Least Monthly Levels of Communication



T1 T2

Quality of the Interactions

Network outcomes related to the CAP were also examined using indicators of quality as measured in the PARTNER Tool. Quality of partner interactions included indices for organizational value and trust as perceived by each partner (Varda et al., 2008a, 2008b). That is, responses aggregated how each partner perceived the collaborating agency. Organizational value to the CAP was measured as an index of 3 characteristics, including power/influence, level of involvement in the CAP, and amount/type of resources contributed by the partner. Trust was measured as an index of mission congruence and openness to discussion. Measures for overall scores in Power/Influence, Involvement, and Contributions are presented in Appendix VI.

Value

The overall score for value was an average measure of power/influence, resource contributions, and level of involvement. This score was used to indicate the extent to which all partners in the CAP network were being leveraged for collaborations. At time-point 1, PCC (3.47), CBOP (3.46), and AVE (3.33) reported the highest value scores; LP (2) was reported with the lowest value score. At time-point 2, NCAAHC (3.83), BBF (3.83), and AVE (3.67) reported the highest value scores, and AMC (2) and NAACP (2) were reported the lowest value scores (Table 18). In other words, agencies with the highest value scores were perceived by others as having the most value to the partnership overall; similarly, agencies with the lowest value scores were perceived by others as having less value to the CAP.

Table 18.

Overall Scores for Value

Partner Type	Partner	T1	T2
Community	AMC	2.33	2
Community	AVE	3.33	3.67
Community	BBF	2.67	3.83
Community	CBOP	3.46	3.19
Community	COFY	2.67	2.83
Community	FOHI	3.13	2.86
Community	GCBH	2.58	3.08
Community	GCHD	2.94	3.48
Community	GHP	3.31	3.55
Community	GHS	3	3.25
Community	GFHC	3.25	3.44
Community	HCHN	2.72	3.37
Community	LP	2	3.67
Community	LUFF	2.33	2.78
Community	MCHWA	2.5	2.44
Community	MPHI	2.62	2.95
Community	NAACP	3	2
Community	NCAAHC	3.17	3.83
Community	NCHE	2.5	2.25
Community	PIHP	3.07	3
Community	WellAIDS	2.83	2.63
Policymaker	DK	2.44	3.20
Policymaker	SN	2.44	2.87
Academic	METHOD	0	3.28
Academic	PCC	3.47	3.59
Academic	UM	3.22	2.79
Academic	UMF	3.18	3.12

The figures below show the relative value of CAP partners that reported at least cooperative levels of collaboration (e.g., cooperative, coordinated or integrated). The larger the nodes, the higher the overall value score of partners. These figures suggest that the majority of partners in the CAP had high overall value, with policymakers (purple nodes) increasing in value at time-point 2 (Figures 8 and 9).

Figure 8.

Sociometric Overall Value for at Least Cooperative Collaborations (T1)

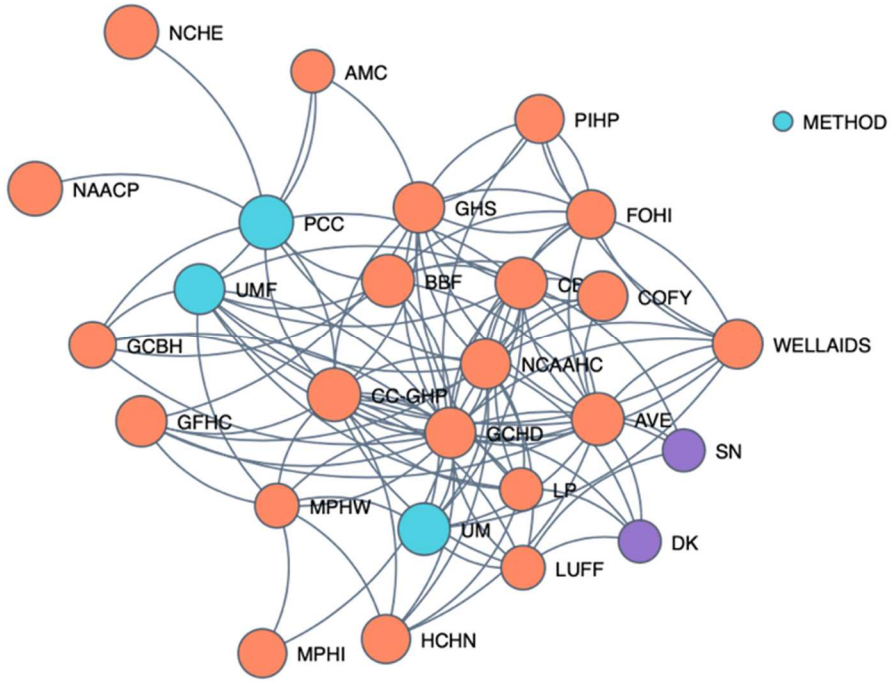
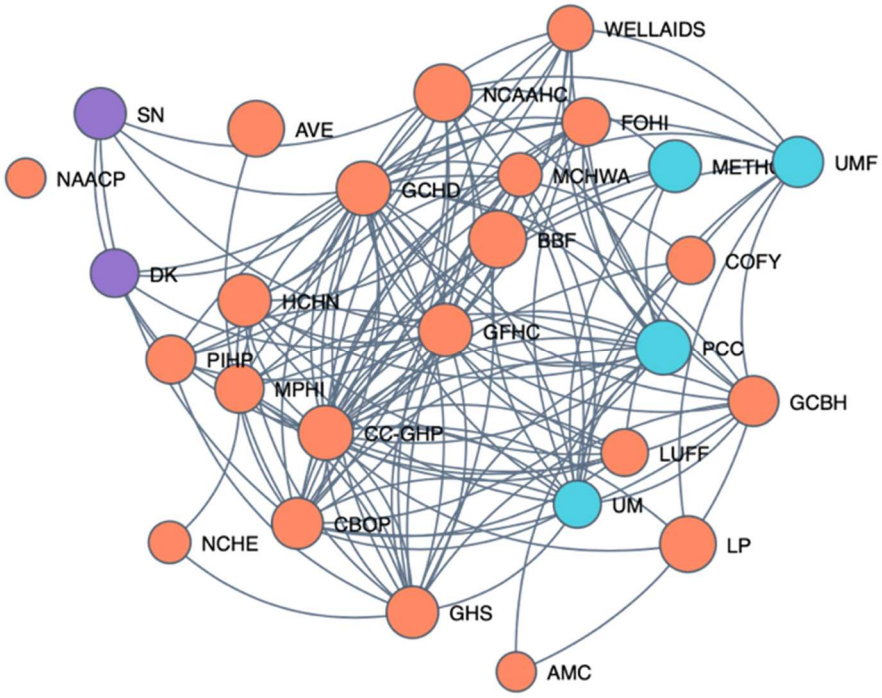


Figure 9.

Sociometric of Overall Value for at Least Cooperative Collaborations (T2)



Trust

The overall trust score was comprised by averaging the measures of mission congruence and openness to discussion. This overall measure of trust was used as an indicator to examine the extent to which CAP members work well together, establish clear and open communication, and work toward a shared mission and goals related to public health equity. At time-point 1, NCHE (M = 3.63), PCC (M = 3.65), and NAACP (M = 3.67) were reported with the highest overall trust scores. The lowest overall trust scores were reported for the two policymakers—DK (M = 2.44) and SN (M = 2.44). At time-point 2, AVE (4), BBF (4), NCAAHC (4), and LP (4) reported the highest trust scores, with NCHE (2.5) being perceived as having the lowest (Table 19).

Table 19.

Overall Scores for Trust

		Perceived Trust		Mission Congruence		Openness to Discussion	
Partner Type	**Partner**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**
Community	AMC	2.5	3.5	2	3	3	4
Community	AVE	3.5	4	3.5	4	3.5	4
Community	BBF	3.5	4	3.5	4	3.5	4
Community	CBOP	3.44	3.37	3.63	3.56	3.25	3.11
Community	CC- GHP	3.58	3.01	3.62	3.55	3.54	3.27
Community	COFY	3.25	3.28	3.33	3.50	3.17	3
Community	FOHI	3.11	3.24	3.22	3.20	3.00	3.20
Community	GCBH	2.92	2.94	3	3.00	2.83	2.50
Community	GCHD	3.32	3.42	3.27	3.36	3.36	3.55
Community	GFHC	3.31	3.49	3.38	3.67	3.25	3.25
Community	GHS	3.33	3.31	3.33	2.88	3.33	3.00
Community	HCHN	3.08	3.55	3.08	3.60	3.08	3.60
Community	LP	2.5	4	2	4	3.00	4
Community	LUFF	2.6	3.17	2.4	2.67	2.8	3.33
Community	MCHWA	2.63	2.59	2.5	2.33	2.75	2.83
Community	MPHI	3.07	3	3.14	3.00	3	3.00
Community	NAACP	3.67	3	3.67	1.00	3.67	2.00
Community	NCAAHC	3.25	4	3.25	4.00	3.25	4
Community	NCHE	3.63	2.5	3.75	3.00	3.5	2.75
Community	PIHP	3.1	2.86	3	2.75	3.2	2.50
Community	WellAIDS	3.25	3.36	3.17	3.50	3.33	3.17
Academic	METHOD	0	3.39	0	3.5	0	3.17
Academic	PCC	3.65	3.58	3.8	3.78	3.5	3.33
Academic	UM	3.44	2.88	3.44	2.88	3.44	2.75
Academic	UMF	3.27	3.1	3.18	3.00	3.36	3.00
Policymaker	DK	2.44	3.08	2.25	3	2.63	3.00
Policymaker	SN	2.44	2.73	2.22	2.60	2.67	2.60

Figures 10 and 11 below show relative trust scores of CAP partners that reported at least cooperative levels of collaboration (e.g., cooperative, coordinated, or integrated). The larger nodes indicate higher rates of overall trust scores.

Figure 10.

Sociometric of Overall Trust for at Least Coordinated Collaborations (T1)

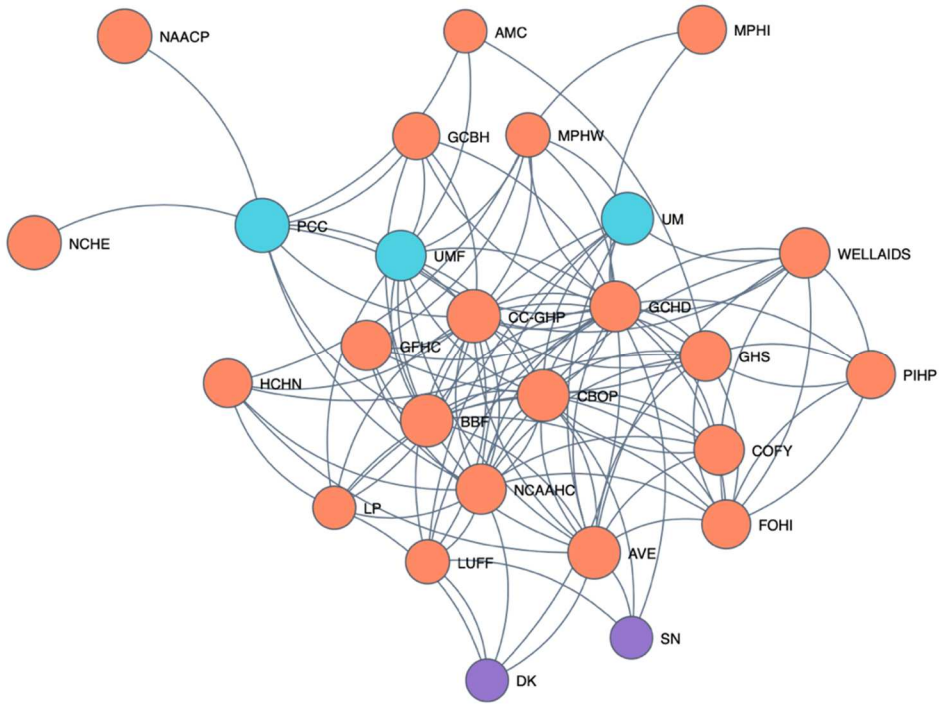
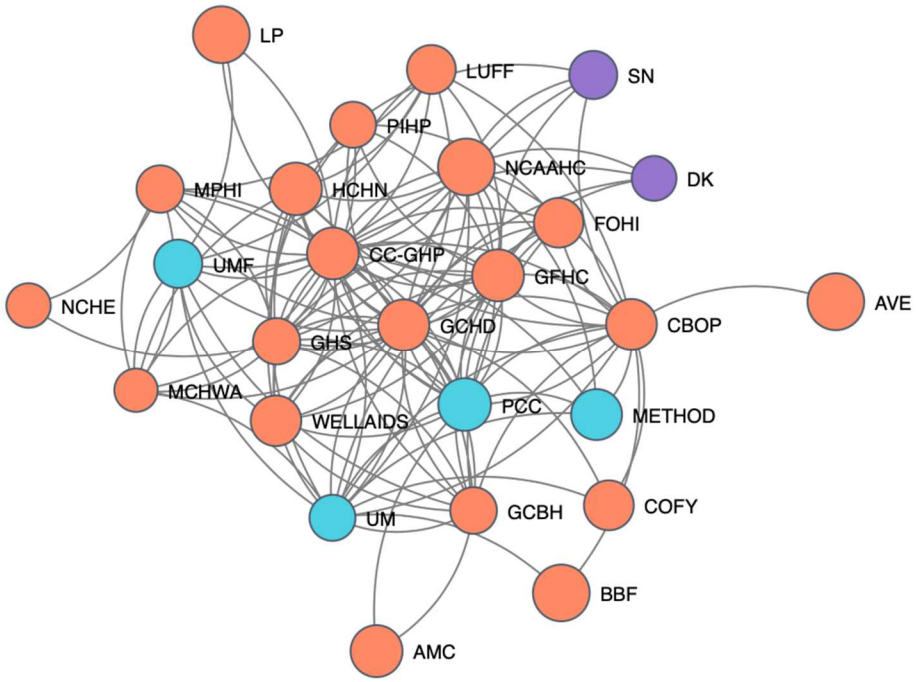


Figure 11.

Sociometric of Overall Trust for at Least Coordinated Collaborations (T2)



Resources

CAP members were asked to report resources contributed to the CAP network. Responses were calculated to represent the total number of resources and diversity of resources, following procedures from previous studies (Chapman & Varda, 2017; Retrum et al., 2013). The total number of contributions were calculated by aggregating resources from each CAP member. To normalize the variable, the sum of resources was calculated by dividing the total number of resources contributed by total possible for the network (e.g., 13 by 25). Table 20 illustrates the sum and proportion of resources contributed to the CAP and the proportion of those resources out of all possible contributions at time-point 1 and time-point 2. A higher proportion implies that CAP members contributed a higher number of resources to the CAP network. Differences

between time-point 1 and 2 were calculated with growth score calculations. Results show that CAP contributions decreased by about 42%.

Table 20.

Network Contributions

	Time-Point 1 (SP 2020)		Time-Point 2 (W2020)		Difference	% Change
Partner	*Sum*	*Proportion*	*Sum*	*Proportion*		
Whole network	104	29%	60	18%	-44	-42.3%

Table 21 illustrates the frequencies of resources contributed by partner type (e.g., community and academic). At time-point 1, the majority of community partners contributed information/feedback (80%), community connections (70%) and advocacy (55%). The majority of academics contributed information/feedback (100%), data resources (67%), funding (67%), specific health expertise (67%), in-kind resources (67%), and facilitation/leadership (67%). At time-point 2, the majority of community partners contributed information/feedback (71.4%), community connections (64.3%), and advocacy (42.9%). The majority of academic partners reported network contributions related to information/feedback (100%) and specific health expertise (100%). Of note, academic partners consistently reported funding contributions to the CAP at both time-points.

Table 21.

Frequencies of Network Contributions by Resource and Partner Type

	Time-point 1		Time-point 2	
Resource	*Academic*	*Community*	*Academic*	*Community*
Community Connections	33%	70%	50%	64.3%
Information/feedback	100%	80%	100%	71.4%
In-kind resources	67%	35%	50%	14.3%
Facilitation/leadership	67%	0%	50%	28.6%
Advocacy	33%	55%	0%	42.9%
Specific health expertise	67%	45%	100%	35.7%
Expertise (not health)	33%	35%	50%	21.4%
Data resources	67%	25%	50%	14.3%
Volunteers	33%	30%	0%	28.6%
Paid staff	33%	5%	50%	0%
Fiscal management	33%	5%	50%	0%
Funding	67%	0%	50%	0%
IT/web resources	33%	0%	50%	7.1%

RQ3. How does perceived success from time-point 1 differ from time-point 2?

Perceived Goals for the Collaborative

To identify the collaborative's goals, participants were asked to endorse which goals they perceived as driving the CAP efforts at T1 and then again at T2 (Table 22). At T1, community partners most frequently endorsed "improved resource sharing" (80%) and "increased knowledge sharing" (80%) as the CAP's goals. Academic partners also endorsed goals related to "increased knowledge sharing" (100%) as well as "public awareness" (100%). Of note, both community partners and academic partners endorsed multiple goals (range = 1-11 and 2-10, respectively).

At time-point 2, community partners most frequently endorsed "increased knowledge sharing" (71.4%) as the CAP's goal. Academic partners, on the other hand, most frequently endorsed "the reduction of health disparities" (100%), "community support" (100%), and "improved communication" (100%) as primary CAP goals. One community partner endorsed goals related to the CAP's reputation as a longstanding resource for the community ("One of our outcomes wasn't just awareness but awareness about issues and resources that are important to

our community. We are developing an identity as the place or the people to come to for public health information"). Responses also indicated that the majority of community partners endorsed multiple goals (range = 1-11), as did the academic partners (range = 3-12).

Table 22.

Frequencies of Perceived CAP Goals by Partner Type

CAP Goals	Community Partner (T1)	Community Partner (T2)	Academic Partner (T1)	Academic Partner (T2)
Health education services, health literacy, educational resources	55%	42.9%	0%	50%
Improved services	45%	21.4%	33.3%	50%
Reduction of health disparities	75%	57.1%	33.3%	100%
Improved resource sharing	80%	50%	33.3%	50%
Increased knowledge sharing	80%	71.4%	100%	50%
New sources of data	55%	28.6%	33.3%	50%
Community support	75%	57.1%	66.7%	100%
Public awareness	70%	35.7%	100%	50%
Policy, law and/or regulation	50%	21.4%	33.3%	50%
Improved health outcomes	75%	21.4%	33.3%	50%
Improved communication	55%	35.7%	66.7%	100%
Other	0%	0%	0%	50%

After identifying the collaborative's goals, participants were then asked to select the most important goal for them to carry out as a partnership. At time-point 1, 50% of community partners identified the "reduction of health disparities" as the most important goal, whereas 67% of academics identified "increased knowledge sharing". Of note, the remaining 50% of community partners endorsed different goals as the most important for the collaborative, including "increased knowledge sharing" (15%), "improved health outcomes" (15%), "improved resource sharing" (10%), "community support" (5%), and "public awareness" (5%). At time-point 2, the majority of community partners perceived "the reduction of health disparities" (27.3%) and "increased knowledge sharing" (27.3%) as the most important CAP goal. Academic partners also selected "the reduction of health disparities" as the most important goal (50%) in addition to "improved communication" (100%) (Table 23).

Table 23.

Most Important Perceived Goal by Partner Type

CAP Goals	Community Partner (T1)	Community Partner (T2)	Academic Partner (T1)	Academic Partner (T2)
Reduction of health disparities	50%	27.3%	33%	50%
Improved resource sharing	10%	9.1%	0%	0%
Increased knowledge sharing	15%	27.3%	67%	0%
Community support	5%	9.1%	0%	0%
Public awareness	5%	18.2%	0%	0%
Improved health outcomes	15%	0%	0%	0%
Improved communication	0%	0%	0%	100%
Policy, law and/or regulation	0%	9%	0%	0%

Goal Congruence

Goal congruence was calculated using approaches from previous studies (see Litt et al., 2015; Retrum et al., 2013) to assess the "degree to which consensus exists" among partners in the network regarding its most important objective (Chapman & Varda, 2017). Participants' responses to the most important network outcome were summed to identify the total number of *different* network outcomes selected by each member. This score was normalized by the total number of possible outcomes (e.g., divided by the total number of possible outcomes). Scores were categorized with the following: High agreement for 1 - 3 outcomes, medium agreement for 4 - 6 outcomes, or low agreement for 7 or more outcomes (Chapman & Varda, 2017; Litt et al., 2015; Retrum et al., 2013). At time-point 1, CAP members shared moderate level of agreement regarding CAP goals (total of 6 different outcomes). Scores of moderate levels of agreement may still show variation across members, but can still be a useful indication of perceived differences. However, at time-point 2, CAP members shared a low level of agreement regarding CAP goals (total of 7 different outcomes).

Perceived CAP Success

Community and academic partners were asked to report the extent to which the CAP was successful in meeting its goals. Frequency tables were created to illustrate the distribution of responses endorsed by partner type at each time-point (Tables 24 and 25). Overall, the majority of partners perceived the CAP as "successful" to "completely successful" at both time-points. Inspection of frequencies by partner type show that the majority of community partners viewed the CAP as "completely successful" at time-point 1, but less so at time-point 2. From T1 to T2, academic partners continued to view the CAP as "very successful" to "completely successful."

Table 24.

Frequency Distribution of Perceived Success Scores by Partner Type at T1

	Partner Type		
Scale for Perceived Success	**Community**	**Academic**	**Total Sample**
Not successful	0%	0%	0%
Somewhat successful	0%	0%	0%
Successful	5%	0%	4.3%
Very successful	35%	66.7%	39.1%
Completely successful	60%	33.3%	56.5%

Table 25.

Frequency Distribution of Perceived Success Scores by Partner Type at T2

	Partner Type		
Scale for Perceived Success	**Community**	**Academic**	**Total Sample**
Not successful	0%	0%	0%
Somewhat successful	0%	0%	0%
Successful	35.7%	0%	31.3%
Very successful	35.7%	50%	37.5%
Completely successful	28.6%	50%	31.3%

On average, both community and academic partners viewed the CAP as very successful, with slightly higher rates observed among community partners at time-point 1 (*Md* = 5, Range = 2). At time-point 2, both respondents from both partner roles perceived the CAP as very

successful (*Md* = 4, Range = 2), with community partners reporting slightly lower scores as compared with academic partners (Table 26).

Table 26.

Mean Rates of Perceived Success by Partner Type and Time

	T1			T2		
Partner type	***n***	**Perceived Success** *M (SD)*	***Md (Range)***	***n***	**Perceived Success** *M (SD)*	***Md (Range)***
Both	23	4.52 (.593)	5 (Range = 2)	16	4.00 (.816)	4 (Range = 2)
Academic	3	4.33 (.577)	4 (Range = 1)	2	4.50 (.707)	4.5 (Range = 1)
Community	20	4.55 (.605)	5 (Range = 2)	14	3.92 (.828)	4 (Range = 2)

Results from Independent-Samples Mann-Whitney U Test indicated that the sample distributions were roughly the same between community and academic partners at timepoint 1 (Mann-Whitney U = 37.00, $p > .05$; $\eta 2 = .018$, $d = .269$) and at time-point 2 (Mann-Whitney U = 8.50, $p > .05$; $\eta 2 = .048$, $d = .0447$) (Table 27). Results from a Related Samples Wilcoxon Signed Rank test showed no significant differences in the median of perceived success scores over time ($Z = 22$, $p > .05$; $\eta 2 = 9.949$; Table 28).

Table 27.

Mann-Whitney U Test Between Group Comparisons for Perceived Success

	Community (*n* = 20)				**Academic** (*n* = 3)				
T1	***M Rank***	***Md***	**Min**	**Max**	***M Rank***	***Md***	**Min**	**Max**	***p***
	12.35	5	3	5	9.67	4.00	4	5	.464
	Community (*n* = 14)				**Academic** (*n* = 2)				
T2	***M Rank***	***Md***	**Min**	**Max**	***M Rank***	***Md***	**Min**	**Max**	***p***
	8.11	4	3	5	11.25	4.5	4	5	.417

Table 28.

Related Samples Wilcoxon Signed Rank Test for Perceived Success at T1 and T2

	T1 (*n* = 23)			**T2** (*n* = 16)				
Perceived Success	***M (SD)***	***Md***	***IQR***	***M (SD)***	***Md***	**IQR**	***Z***	***p***
	5 (.5931)	5	4, 5	4 (.8165)	4	3, 5	22	.169

Exploratory Correlational Analysis: How do SNA Measures and Organizational Characteristics (Trust and Value) Relate to Perceived Success? Exploratory correlational analysis was used to identify any relationships between rates of perceived success, trust, value, and network measures (e.g., degree, betweenness, closeness, degree centrality, in degree and out degree centrality). Spearman's Rho indicated no significant correlations at either time (*p*'s > . 05) between overall scores of trust or value with perceived success.

At time-point 1, perceived success was highly correlated with number of goals (rho = .509, $p = .013$), indicating that higher perceptions of success were associated with higher number of goals reported for the CAP. Type of partner negatively correlated with trust (-.502, $p = .009$) and value (-.523, $p = .006$), as well as positively correlated with out-degree centrality (rho = .410, $p = .042$). Measures of degree positively correlated with overall value (rho = .635, $p < .001$), mission congruence (rho = .401, $p = .038$), and openness to discussion (rho = .390, $p = .045$) scores. In-degree centrality also positively correlated with overall value (rho = .455, $p = .026$). Measures of betweenness positively correlated with overall trust scores (rho = .451, $p = .021$). Measures of closeness positively correlated with overall value (rho = .507, $p = .008$) and mission congruence (rho = .388, $p = .045$) scores.

At time-point 2, perceived success was positively correlated with degree (rho = .498, $p = .05$), indicating that having more collaboration ties was associated with higher perceptions of CAP success. Overall trust and value scores were positively correlated with one another (rho = .702, $p < .001$). Measures of degree positively correlated with power/influence (rho = .398, $p = .049$) and resource contribution (rho = .432, $p = .031$) scores. See Appendix VII.

External Factors Related to COVID-19

Strengths of the CAP (T1)

When asked specifically about the strengths of the CAP, the majority of participants described the opportunity to collaborate with diverse stakeholders toward a shared goal of health equity. In considering the FCHES CAP, in particular, many partners also noted partner characteristics, including the diversity of expertise, experience in equity leadership and genuine commitment of partners collaborating for a shared goal. Other participants described the gains in accessing education that helped raise awareness about health-related issues in the Flint community.

Strengths of the CAP during COVID-19 (T2)

At time-point 2, CAP partners were asked to share any strengths they noted in maintaining the CAP throughout the pandemic. A variety of strengths highlighted CAP efforts to disseminate evidence-based information regarding COVID-19 and resources grounded in the Flint community, which helped promote knowledge and understanding about what is accessible for their organization and populations served. Others shared that the CAP had functioned as a centralized source of communication throughout this period using education forums. Some partners felt strengthened by the CAP, encouraging collaborative efforts to deal with the crisis by leveraging resources for mutual benefits to address equity challenges that were highlighted throughout the pandemic. Consistent leadership meetings also helped maintain the direction of the CAP's efforts in addressing inequities related to public health issues that the Flint community was facing.

Engagement in Pandemic-Related Activities

At time-point 2, participants were asked to report their engagement in pandemic-related activities focused on driving the CAP's health equity agenda. Of note, these activities were informed by ethnographic observations of weekly community webinars and meeting memos with core leaders. Overall, CAP partners reported participating in the following activities most frequently: participating as speakers for community webinars (15.9%), attending webinars to support other health advocates on sharing pandemic-related information (14.8%), disseminated information on testing sites (13.6%), and other educational materials to raise community awareness (12.5%). Ethnographic observations of the CAP's community webinars were used to impute whether a partner had participated as a speaker, along with archival records that demonstrated actual registration attendance to the webinars (Table 29).

Table 29.

Frequencies of Endorsed Pandemic-Related Activities

Activity	N	%
Participated in a webinar (as a speaker) to promote awareness related to COVID-19 and other issues relevant to the Flint community	14	15.9%
Attended virtual webinars (as a participant) to support other health advocates/agencies sharing information on COVID-19 or other issues specific to the Flint community	13	14.8%
Disseminated information on available testing sites	12	13.6%
Disseminated educational materials on COVID-19 to raise community awareness	11	12.5%
Assisted in providing accurate and up to date information on COVID-19	10	11.4%
Created materials to provide community members with knowledge and information on COVID-19	9	10.2%
Collaborated with other research centers or community-academic partnerships	7	8.0%
Helped coordinate trainings related to pandemic	6	6.8%
Created/Revised a website to promote knowledge on prevention and protection	4	4.5%
Did not engage in any activities related to the pandemic or toward health equity goals	1	1.1%
Other type of activity	1	1.1%

RQ4. What are partners' motivating factors to engage with the CAP at T1 and T2?

Motivations to Participate in the Collaborative

To address the following research question—what are partners' motivating factors to engage with the collaborative at T1 and T2—nominal datum from the DPQ survey item was analyzed. Multiple response frequencies were created and aggregated by type of partner (e.g., community vs. academic) (Table 30). At time-point 1, the majority of community partners were motivated by the idea of collaborating with other agencies that shared their organization's philosophy (70%) and the opportunity to network with other community providers (60%). The majority of academic partners also reported motivational factors related to the opportunity to network with other community providers (100%) with motivation for the need of a systematic adoption and implementation process for new evidence-based practices (66.7%). Frequencies of motivating factors were transformed to count scores, demonstrating a sum and mean number of motivational factors reported by partner. Community partners reported an average of 3.3 (SD = 2.975, Md = 2, IQR = 5) motivating factors; academic partners reported an average of 3.33 (SD = 2.082; Md = 4, range = 4) motivating factors. Independent-Samples Mann-Whitney U Test was used to further explore differences between partners. Results indicated that the sample distributions were significantly different (Mann-Whitney-U = 26; p =.049; η^2 = 0.006, d = 0.153), suggesting that academic partners (Mean Rank = 19.17) reported more motivating factors than community partners (Mean Rank = 10.93; See Table 31). Of note, missing data was given a "9999" to filter out from the final frequency scores (1 academic and 1 community).

At time-point 2, the majority of both community and academic partners were motivated by the idea of collaborating with other agencies that shared their organization's philosophy (92.9%; 100%, respectively), and the opportunity to network with other community providers

(78.6%; 100%, respectively). Academic partners also endorsed motivational factors related to the experiences with other CAP members (100%) and the reputation of the CAP in the community (100%). Community partners also reported "other" motivating factors, including the need for partnership synergy (e.g., "participating with the CAP adds richness to my work with the PC members bringing expertise, perspective and wisdom that I lack") and the desire to advance and promote health equity work. Frequencies were transformed to count scores, following the same procedures from time-point 1. Community partners reported an average of 4.64 (*SD* = 3.153, Md = 3.5, IQR = 3) motivating factors; academic partners reported an average of 9.5 (*SD* = 7.778; Md = 9.5, range = 4 - 15) motivating factors. These scores were further examined with Independent Samples Mann Whitney U Test. Results indicated that the distribution of scores were roughly the same between partner types (Mann Whitney U = 6, $p > .05$, $\eta^2 = 0.101$, $d = 0.67$; Table 31).

Table 30.

Motivational Factors by Community and Academic Partner (T1 and T2)

Motivation (from DPQ item)	Community Partner (T1)	Community Partner (T2)	Academic Partner (T1)	Academic Partner (T2)
The idea of collaborating with other community agencies fits with my agency's/program's philosophy	70%	92.9%	33.33%	100%
Opportunity for networking with other community providers	60%	78.6%	100%	100%
Number of studies my agency/program is asked to participate in	5%	14.3%	0%	0%
Experiences with other CAP members	20%	28.6%	33.3%	100%
Reputation of CAP and/or the research team in the community	10%	21.4%	0%	100%
Need for a systematic process for adopting and using new evidence-based practices	35%	35.7%	66.7%	50%
Pressure to implement new evidence-based practices	0%	0%	0%	50%
Participation in other research studies	10%	14.3%	0%	50%
Fiscal implications of participation in a collaborative group	5%	14.3%	0%	50%
Opportunity to use the systematic process that is developed to help adopt and use new evidence-based practices within my agency/program	20%	28.6%	0%	50%
Time implications of participation in a collaborative group	10%	14.3%	0%	50%
Alignment of collaborative principles with agency/program policies	35%	35.7%	33.3%	50%
Administrative support for collaboration in order to develop a systematic process for adopting and using evidence-based practices	20%	14.3%	0%	50%
Need for adopting and using new evidence-based practices	10%	14.3%	33.3%	50%
Opportunity for future training/consultation	15%	42.9%	33.3%	50%
Other	5%	14.3%	0%	50%

Table 31.

Mann-Whitney U Test Between Group Comparisons for Motivating Factors

T1	**Community** (n = 20)				**Academic** (n = 3)				
	M Rank	***Md***	***Min***	***Max***	***M Rank***	***Md***	***Min***	***Max***	***p***
Motivating Factors	10.93	2	1	10	19.17	4	1	5	.046
T2	**Community** (n = 14)				**Academic** (n = 2)				
	M Rank	***Md***	***Min***	***Max***	***M Rank***	***Md***	***Min***	***Max***	***p***
Motivating Factors	7.93	3.5	1	11	12.5	9.5	4	15	.267

Changes in Motivating Factors Over Time

Motivating factors were also examined over time to answer the sub-question: How have motivating factors changed across time-point? The total count score for motivating factors was aggregated (e.g., community with academic) to compare CAP scores over time. At time-point 1, the CAP scored an average of 3.3 (*SD* = 2.835; *Md* = 2, *IQR* = 1, 5); at time-point 2, the CAP scored an average of 5.25 (*SD* = 3.924, *Md* = 4, *IQR* = 3, 7) motivating factors. To examine these differences, Related Samples Wilcoxon Signed Rank Test was used. Results indicated that the median of differences between motivating factors at time-point 1 (*Md* = 2) and time-point 2 (*Md* = 4) were not significantly different ($Z = 83$, $p > .05$; $\eta^2 = 4.54$. Although, motivating factors were higher at time-point 2, results show that the changes weren't statistically significant from the median of responses at time-point 1. See Table 32.

Table 32.

Related Samples Wilcoxon Signed Rank Test for Motivating Factor

Motivating Factors	**T1** (*n* = 23)			**T2** (*n* = 16)				
	M (SD)	***Md***	***IQR***	***M (SD)***	***Md***	***IQR***	***Z***	***p***
	3.3 (2.835)	2	1, 5	5.25 (3.924)	4	3, 7	83	.190

Phase 2: Qualitative Findings

Unexpected Events

In March 2020, a public health pandemic had been nationally reported with the introduction of state level policies put in place to restrict person-to-person interactions for prevention of viral spreading and onset of COVID-19. These policies halted all in-person interactions with CAP members, plans to meet with policymakers at the Capitol, and other planned activities to improve the CAP's legitimacy, support, and engagement among its members and the Flint community. Ongoing changes to state level policies continued to extend

stay at home orders, restricting organizational capacity, meeting and work capacities, and any other settings typically hosting social spaces. During this time, FCHES underwent organizational changes, such as remote work and virtual meetings, while also maintaining daily check-ins, monthly meetings with core leaders, and other efforts to maintain collaboration among members. Furthermore, many CAP members were undergoing extraneous stress in responding to community needs. Data collection for time-point 1 interviews were suspended and modified to elicit perspectives from community partners at time-point 2 to avoid additional stressors at the time. Instead, interviews were conducted with CAP leaders to learn about their leadership experiences in facing a public health crisis and in maintaining a CAP within that very same context.

CAP Leader Interviews

Participants

The three primary core leaders of the CAP participated in brief semi-structured interviews during Summer 2020 to discuss facilitating and hindering factors to collaboration in the context of the public health pandemic. CAP leaders included two academic PIs and one community co-director).

Themes

Using the MRCP's conceptual framework, codes and categories were aligned to each phase and components, when applicable. Qualitative data was coded as interpersonal processes, perceptual processes, or operational processes to better understand the CAP, along with its dynamic changes in response to the pandemic. Given that the CAP leaders were most knowledgeable about the shifts to the CAP along with the decisions that would be taking place in

response to community partners' needs throughout this challenging time, the interview data was themed according to the RCP's phases of formation and community context.

Two major themes emerged from CAP leader interviews: (1) formation of the collaborative process; and (2) community context. Description of themes, and categories subsumed within each theme, are discussed in more details below.

Theme 1. Formation of the Collaborative Process

Formation of the collaborative process highlighted the overarching CAP model, describing elements of the operational processes of the CAP. *Operational processes* captured details related to the CAP's overarching infrastructure. Subcategories included: (a) leadership structure, (b) communication structures, and (c) decision-making approaches.

Leadership Structure

The subcategory related to leadership structure included CAP leaders' comments about how leadership was driving the CAP's efforts in health equity. All three leaders stated that the model of the CAP was grounded on that of a community-academic partnership with leadership driven from community representatives on the consortium board. The leadership structure was described as a "*unique aspect*," where a community director functioned as the community co-lead who "*knows the partners and the community*." Prior to community partner joining the leadership structure, the CAP was "*having a hard time getting off the ground*" and had to undergo "*some changes in leadership*." One leader stated, "*We started off with it being kind of community engaged, community participatory. Now it's become much more community driven*" (P011). This suggests that the integration of community voice into the leadership structure may have greatly improved CAP efforts. A community leader shared, "*As I assume more of a leadership in the project, our goal is to really get other partners excited about this and to*

partner with them, not to have another meeting...or a set of meetings, but to really start looking at some of these [equity] issues" (P001).

Comments related to key leaders involved with the overall leadership structure were also discussed. Community and academic leaders driving the CAP were described as reputable, credible, and trusted public health leaders with existing connections to other key players in health equity. One leader shared, "*The formal leader of the consortium has been a constant on the consortium board from a community perspective the entire time... And [they're] fantastic because as the head of the [org], [they] interact with all of the other health [partners] and all of the providers, very well connected...has a strong and credible reputation in the community and is a trusted community leader"* (P011).

Communication Structures

The subcategory related to *communication structures* included CAP leaders' comments regarding the communication systems established to share information across leaders and to partners or other key stakeholders who are not directly involved in the leadership structure. When asked about the communication structures of the CAP, leaders discussed monthly team meetings with core members, including two additional community members who were leaders in other cores. Communication outside of core leaders (e.g., to other partners in the CAP) tended to involve email with the purpose of finalizing and/or following up on decisions. One leader shared, "*We've gotten to the point where our partners are more responsive to email, so it creates a more efficient process*" (P002).

Decision-Making Approaches

The subcategory related to *decision-making approaches* captured details about how decisions were made in the CAP to better understand the roles of community and academic

partners in that process. Generally, CAP leaders described the decision-making processes as informal and organic, occurring naturally out of discussions in meetings, unplanned but with intentionally behind its community-driven design. One CAP leader shared, "*There are people present during these meetings and someone will come up with an idea, we'll all chime in it, will take shape and then it will be agreed upon right there in that meeting"* (P002). Another CAP leader shared a similar view stating, "*When[ever] you open your mouth, something happens a lot of times"* (P001).

All leaders shared an example of a decision-making approach to generate a needs assessment. Both community and academic leaders collaborated to create a survey to assess the needs for partnering agencies during the pandemic. The survey was proposed, discussed, and finalized at a monthly meeting during March and April 2020 in the early formation of the shifted CAP. Further, this project (among others) "*was an idea from one of our community leaders*." Here, community core leaders' roles provided additional feedback that would guide further considerations related to the appropriate amount for a stipend that could support partnering community-based organizations facing challenges due to the pandemic. One leader illustrated, *"We [academics] were able to say, you know from an administrative standpoint, this is the range that we're able to give and then the community members were able to come in and say well this is the particular amount that would be meaningful to respond or to the folks who would be receiving it*" (P002).

When asked specifically about how community and academic partners played a role in the decision-making, leaders shared that the process was equal and collaborative, yet restricted. All ideas (regardless of source) were considered for discussion, with ongoing feedback to shape it for more agreement amongst other leaders and partnering agencies. One leader noted, *"Input is*

equal so whether it's an idea that's coming from the mouth of an academic or the mouth of a community partner, I think we all recognize the strengths and the experience of one another ... power in that sense is equal" (P002). However, each *type* of partner carried out a particular role. Participants shared how they perceived the role of academic leaders in decision-making as administrative and as thought partners, rather than making and then carrying out the ultimate decision. One academic leader stated, "*We're not really clear about the kinds of things we could be asking to support [community]..."* (P011), emphasizing the need to expand to community partners' perspectives to make informed decisions rather than single handedly make decisions in silo. To that end, academic partners seemed to function as a resource to build out identified community needs. As another leader stated, "*each side brings information into the decision-making process*" (P002).

The CAP's decision-making approaches were described utilizing the analogy of building a house. As indicated by one CAP leader, not one person is able to build a house alone, but "*everybody brings their relative expertise to the building of the house*" (P011) or to a shared goal. To carry out each step, *"You have to think it through and talk it through and do that walk through of the work together because I don't have the knowledge and insight that community has and they don't have access to the knowledge and insight and rigor of research that I have"* (P011). Another leader emphasized the role of community partners at all levels, *"We really need those thought leaders and CEO type people, but we also need... the boots on the ground staff to be involved in this as well*" (P001). Integrating community-driven agendas into decision-making can then create more sustainable community-based health equity solutions than what could be produced by researchers alone. As one leader stated, "*Researchers can't create sustainable community-based health equity solutions by themselves*" (P011).

Theme 2. Community Context

Community context highlighted external influences and attempted to capture the community context in which the CAP was functioning. Two subcategories emerged, including (1) changes to the CAP due to COVID-19; and (2) other external impacts. Subcategories within each of the broader categories are discussed in more detail below with illustrative quotes.

Changes to the CAP due to COVID-19

This category included details CAP leaders shared about any pandemic-related impacts or changes made to the interpersonal, perceptual, and operational processes of the CAP.

Interpersonal Processes. The subcategory related to *interpersonal processes* captured details describing how the pandemic impacted relationships, relationship-building strategies, trust, roles, responsibilities, and/or complementary goals. Overall, the relationship between community and academic members were viewed as bidirectional with a shared agreement and commitment to health equity solutions, applying these principles in their setting or in practice. One leader stated, "*It's not a one-way relationship or a one-way agreement. There's an agreement*" (P011). Prior to the pandemic, CAP leaders acknowledged that there was an existing need to strengthen relationships with partners, particularly with new staff onboarding over the summer. Accordingly, this presented an opportunity to clarify roles for other partners in the CAP. As one leader stated, "*We wondered if they even knew what their role with the [ ] partnership [was]*" (P002). Additionally, there was the opportunity to continue to build relationships with community partners that were grounded on their current needs, "*We want to hear from you [partners] and know what your needs are and how we can help...*" (P011).

When asked about any specific changes that had occurred in response to the pandemic, leaders emphasized that the direction of the CAP continued to align with their core operating

principles—asking the community what was needed and then acting upon the needs that were shared. However, changes were made to the CAP to find alternate ways to achieve collaborative health equity efforts in the community. Leaders also discussed ongoing efforts to build relationships (prior to the pandemic) including a convening of all CAP members in January, plans to engage with policymakers at the city capitol, among other face to face meetings with partners to meet CAP goals. However, because CAP leaders needed to "reshuffle," relationship building strategies needed to utilize virtual options to facilitate meaningful collaborations with local, state and national partners. One leader stated, "*We kind of just had to rethink you know what's our purpose in doing all this and how can we still reach that... get that done without doing it in person*" (P002). This view was shared from another leader who discussed how the CAP's active efforts to build relationships were interrupted, "*We were just starting that process, then the pandemic hit. So, we had to reshuffle*" (P001).

To continue building relationships and establishing trust, CAP leaders utilized several strategies to maintain ties that were generated from ongoing discussions and results from a needs assessment to "*understand how services had changed, how the services that our partners are providing have changed since COVID, how the needs of the people that they're serving have changed, and how as an organization the needs of our partners changed... how can FCHES support the work you're doing?*" (P002). Findings from the needs-assessment led to financial support provided to partners in the form of a stipend. Given shared concerns related to role ambiguity among CAP members, other strategies to build relationships during a pandemic included individual meetings with agency leaders to directly ask how the CAP can support them and their shared goals as a partnership or clarify any ambiguities throughout this time. Specifically, a leader stated, *"We were doing one-on-one meetings with the local partners, we*

wanted them to get to know us to see our face to think you know if they had any extra questions or partnership questions, and if they needed information that they could reach out to [staff] or I, get to know their needs and just try to create this relationship virtually" (P002).

CAP leaders also emphasized that there were precautions made in not overburdening partners by limiting email invitations and keeping any individual meetings less than an hour long. Regardless, CAP leaders stayed motivated to establish stronger ties with partners, particularly during a challenging time. One leader shared, "*I think this has only strengthened our relationship with our partners because we are staying proactive*" (P011).

Perceptual Processes. The subcategory related to *perceptual processes* captured details about how the pandemic had impacted motivating factors to participate with the CAP along with any perception of the CAP's success. When asked about how partners viewed the CAP, some CAP leaders shared that they were not sure how community partners perceived the CAP prior to the pandemic but noted that partners seemed motivated to collaborate at the convening in January 2020. One leader stated, "*I can't speak to whether that was there previous to the convening, but... there was a whole lot of energy during that convening*" (P002). Another leader helped expand insight from the perspective of community partners by sharing, "*We were meeting at the beginning and to be quite honest, I didn't feel like it was going really anywhere*" (P001). Furthermore, other community partners' motivations to participate with the CAP were described as, "*A lot of them [community partners] are looking for, I think is how do they fit in into the bigger picture of all of this work, this equity work*; *...a lot of the partners are really looking to be able to be better connected*" (P001).

CAP leaders reported that actions taken during this time had fostered knowledge, power and inspiration about the CAP with the demonstration of concrete examples of what health

equity collaborations can do in practice. For instance, one leader described how the demonstration of their support throughout the pandemic may have motivated community partners to collaborate more than before. Because the CAP was illustrating its commitment to their partners by its actions, this had the potential to demonstrate the value of their partnership through real world impacts on community-based organizations. Specifically, "*You get a clear example of how another partner engaged with us to get this need that they've had for some time that they didn't have the resource or the knowledge or the thinking to get addressed. And then it just gives you clarity to think about 'what does that mean for my organization?'*" (P011). In doing this, leaders thought partners had seen real and salient examples of health equity efforts and were expected to "*see clear value added to themselves, their organizations and their populations*" (P011). Other leaders reported that the pandemic had encouraged more key leaders to participate and be more engaged, "*What helped as an outcome of this pandemic is that some more of the senior leaders at other organizations are more involved,"* (P001).

Operational Processes. The subcategory related to *operational processes* captured any details describing how the pandemic had impacted leadership, administrative, or communication structures. During the pandemic, all communication procedures were moved to email, face-to-face meetings using zoom, texts, and other virtual tools for team engagement to maintain communication before and outside of these monthly meetings. In response to the lack of in-person interactions imposed by the stay-at-home orders, leaders discussed new efforts to create a policy newsletter, a broader electronic community newsletter, sending more frequent emails to partners regarding opportunities for funds and other details related to how the CAP is a source of support for community-based agencies throughout this challenging time. These efforts aimed to make the CAP consistent for partners, with a thread of disseminating knowledge, credible

information, and accurate data related to prevention and best practices in partnership. One leader shared how these changes to the operational processes, "*offered clarity to our mission and what we were doing"* (P002). Another leader shared how changes to the CAP administrative structure better supported community partners*, "It's been good to have the [CAP] and particularly the staff...in that group to work on some of those research and data and policies... while the rest of us [community partners] have been busy, [they're] just minding the fort and making sure we're surviving this"* (P001).

Other External Impacts. Other external impacts included other research centers, namely, the Healthy Flint Research Coordinating Center (HFRCC), that played a major role in maintaining relationships and was considered integral in continuing to build trust. The CAP collaborated with the HFRCC to coordinate a weekly webinar that was central in disseminating COVID-related information. The webinar was designed to address the mistrust in the Flint community by assuring verifiable health information shared through trusted leaders and partners. One leader shared, "*Our center director, through her involvement with the Healthy Flint Research Coordinating Center has ...been able to use this webinar as a way to keep community providers, nonprofit organizations engaged and informed"* (P002). Additionally, in light of the pandemic, CAP leaders shared other external impacts directly from COVID-19 on health equity work. One leader stated, *"COVID has only illuminated how healthcare system in the U.S. functions as a privilege linked to race and socioeconomic status rather than a human right, particularly among communities of color*" (P011).

In conclusion, these qualitative interviews with CAP leaders at time-point 1, in replacement of partner interviews, provided valuable insight into the iterative formation of the collaborative process in which the CAP actively occurring prior and throughout COVID-19.

Rich details highlighted operational processes, expanding on leadership structure between community and academic partners, communication structures, as well as decision-making approaches. The theme related to community context then expanded on how the CAP was functioning in response to COVID-19 and other external impacts. These themes illustrate the current state of the CAP's internal infrastructure at time-point 1.

Qualitative findings: Community and Academic Partner Interviews

Partners

A subset of nine participants who completed the quantitative survey at time-point 2 agreed to participate in individual time-point 2 qualitative interviews. This subsample included two academic partners (50% of all academic partners) and seven community partners (41% of all community partners). Three community partners and one academic partner explictly declined to participate in the interview. The rest did not reply to repeated invitations to participate in the qualitative interviews.

Facilitating Factors

Three themes were found most salient across interviews: (1) facilitating factors specific to the CAP; (2) facilitating factors for broader public health equity collaborations; and (3) facilitating factors from external influences. Subcategories within each of the broader categories are discussed in more detail below with illustrative quotes.

Theme 1. Facilitating Factors Specific to the CAP

Facilitating factors specific to the CAP captured details that described facilitators directly related to the case study. Four subcategories were found salient for this theme, including: (a) good quality of leadership, (b) overall CAP infrastructure, (c) good relationships between partners, and (d) shared vision, goals, and/or mission.

Good Quality of Leaderships. Nearly all participants discussed facilitating factors related to having good quality of leadership with reputable and established leaders. The core leaders of the CAP were "*so respected in the community and through their leaderships*" (P004). Leadership played a major role in developing trust between partners through their reputation and history of establishing trusting relationships with those in the community. "*When people are lost and they don't know where to go, they go to a name and people went to [Leader names] for information*," (P002). Other qualities of leadership that facilitated the CAP included their efforts to integrate community matters: "*They come to the table listening first*" (P004). These findings suggest that having leaders with strong reputations, who are well-respected and trustworthy can facilitate collaboration efforts.

Overall CAP Infrastructure. Some partners described the CAP's overall structure as a facilitating factor that provided opportunities for creating informal relationships, having structured meetings, and building good relationships between partners. First, the intended structure of the CAP attempted to include a community and academic leader at every level of a project, which was viewed as an effort to make all processes of the CAP as well as the broader research center transparent for its members. The CAP also provided the infrastructure for potential collaborations. For instance, in trying to maintain regular, standardized meetings, there was an infrastructure in place that offered opportunities for partners to meet one another informally and build relationships: "*I could talk to people that I wouldn't usually, I wouldn't contact via email*," (P009). Of note, while these structured meetings were proven useful in improving collaboration efforts, these were not sustained over time. Overall, partners reported that the infrastructure was critical in establishing elements of partnerships' trust and transparency

that allowed for its continued functioning: "*I think we survived because those things were in place*" (P007).

Good Relationships Between Partners. Other facilitators described the impact from having good relationships among or between partners on collaborations. Generally, partners described their relationships as positive both between consortium core leaders and other CBOs. The ability to rely and build on existing relationships also greatly facilitated establishing new relationships through the CAP as well as mobilizing collaboration efforts. For instance, many community partners had prior relationships with other partners, either through other health equity efforts or community meetings unrelated to the CAP: "*Those partnerships were established as we were working on other health equity things*" (P004). Having previously established informal relationships facilitated their involvement as a CAP representative for their agency. Another example was illustrated with a community partner representative who had worked with the Greater Flint Health Coalition for over 3 years prior to becoming employed at their new agency. Having that prior relationship ensured them that the CAP was trustworthy and at the very least worth the while to join as a partnering representative. Relying on existing relationships also facilitated new collaboration efforts. For instance, many of the core community leaders were able to relay information out to others (not involved with the CAP) regarding the community webinars that were created during COVID-19.

Having these good relationships also facilitated resource sharing. One partner described how their relationship with the health department had been wonderful in providing access to data for COVID-19. The broader group of community partners were also viewed as reputable: "*A lot of them are great boots on the ground and do a lot of great work in the community*" (P001). Other examples of sharing resources provided from participants included a collaborative

relationship facilitated by sharing resources through referrals about their food pantry and disseminating information to the community about upcoming events. To this end, partners reported that while these factors facilitated collaborations, there also needed to be a clear demonstration of value in connecting community partners with the health equity effort: "*If you can show the value like that policy report for example, it's going to be key*" (P001).

Shared Vision, Goals, and/or Mission. Facilitating factors related to having a shared vision, goals, and/or mission driven in health equity solutions were also considered important factors in collaborations. One community partner shared how other collaborators from their organization were also partnering with the CAP, illustrating an example of how "*We already play in the same space*" (P003), which made it easier to partner with other CAP members. That is, having a sense of shared vision, goals and/or mission demonstrated a prior commitment to health equity. Relatedly, this also indicated the extent of the alignment of collaborative principles and agency policies in reducing public health equity issues.

Theme 2. Factors for Broader Health Equity Collaborations

Facilitating factors specific for broader health equity collaborations captured details on what would make collaborations easier in the context of broader collaboratives outside of the CAP (but building on that existing knowledge as a partner). Six subcategories of facilitating factors were found salient, including: (a) equitable power, (b) good quality of relationships, (c) putting in early work, (d) mutual benefit for all partners, (e) innovation and diversity of partners, (f) effective and/or frequent communication, and (g) characteristics of partners.

Equitable Power. Others elaborated on the process of ensuring equity of partnerships, emphasizing power dynamics among all partners and inclusion of community needs. One community partner stated, "*There's a lot of hard work that needs to happen to make sure that*

legs of the stool are equal in level" (P006). These discussions highlighted the need for power-sharing across all partners to ensure all voices are heard and the need to integrate community needs and priorities. As one community partner described, "*Hearing everyone's voice and not just the ones that are funded most, but all ideas should be listened to, valued, and appreciated*" (P006). Other facilitating factors were related to leadership, where community partners emphasized how leadership should be decentralized and shared among multiple partners to successfully coordinate the broader group with attention to different skillset and abilities among diverse groups. Another partner shared similar comments, highlighting how all partners must have an equal chance to contribute: "*if you don't have that voice from all partners, you can't move ahead*" (P004). Another community partner discussed a balance needed between individual needs and community: "*There has to be a balance between what the community needs and what the individual needs, and there has to be common ground and the broader, the common ground is the better off everybody will be*" (P008). Partners also highlighted the need to include community voice and perspectives to facilitate successful collaboration outcomes, "*Everything that we should be doing to support our community starts by starting with the people and starting with what they think is important. Not what we think is important for them, because if you don't acknowledge what they're telling you and address those things, you're not going to get where you need to go for the things that you may think they need*" (P006).

Good Quality of Relationships. Partners described various relationship qualities that were considered important to maintain collaborations as well as assure positive collaborative outcomes. These qualities called for relationships that are genuine, trusting, and respectful, with recognition that "*partners need to take time to actually build that relationship*" (P005). Of note, community partners viewed respect as a value inherent in their collaborative relationships and

critical to advance any partnerships forward. Having relationships that are genuine and trusting were viewed as drivers for making public health equity collaboration work successfully: "*Good solid relationships could make programs work, even if they're not well-designed, but right designed programs that don't have good relationships, they can fail*" (P006). Another academic partner emphasized intentionality behind relationship-building, how "*It[relationships] has to be much more intentional*" (P009).

Another important relationship quality that was described as a facilitator for collaborations was related to the bidirectional nature of partnerships: "*I feel very strongly that it has to be a two-way street*" (P008). One community partner further explained, "*It's bi-directional, you know, not only does each community group and leader gain* [outputs], *but they're also able to offer input*" (P004). Facilitating factors that were considered important to sustain a CAP over time were related to the bidirectionality of partnerships. Partners also underlined how CAP members should maintain the bidirectionality of collaboration by tending to relationships: "*understanding their [community partner] needs, strengths, seeing good in them, seeing the things that they are not so good at seeing a future for them seeing a future for the both of you*" (P002).

Putting in Early Work. Another facilitating factor that emerged was related to putting in early work for relationship-building to clarify expectations, roles, goals and for the purpose of sustaining partnerships over time. Participants described how important it is to do "upfront work" that allows for genuine relationship-building, as well as understanding the roles of partners in these collaborations. One community partner stated, "*I think that doing the upfront work is what's most important, emphasizing transparency and exploring interest and coming up with, uh, what your common interests are, knowing what you're going, want, what you want to*

work on together and what you aren't necessarily wanting to work on together..." (P005). Another academic partner shared similar sentiments, stating the importance of "*setting those priorities and those expectations out very early*" (P009). Putting in early work was believed to allow for the level of relationships among partners that are needed to sustain a CAP beyond the scope of individual projects or grants.

Mutual Benefit for All Partners. Majority of partners discussed the facilitating role of having mutual benefits for all partners in collaborations. A consistent viewpoint underlined how any collaboration should demonstrate the value of health equity outcomes to illustrate clear benefits to the individual, community, and broader society. One community partner shared, "*The idea is that it doesn't matter whose flag is in it, as long as we're getting to where we want to get*" (P004), emphasizing the end goal of improved health equity for all. Mutual benefits in a partnership were also considered critical to ensure equity. One community partner illustrated, "*If there isn't equity coming out of the partnership [through mutual benefits], it's going to be that three-legged stool that have a short leg on, or a two short legs or whatever... It can't stand at all*" (P005).

Innovation and Diversity of Partners. Other facilitating factors were related to innovation and diversity of partners to broaden reach and community impact. Two community partners emphasized how public health collaborations need to be innovative. In this regard, collaborations should think outside the box and consider organizations that are less traditionally involved in providing direct services, design creative activities to pull diverse community members into the CAP, and be able to serve the most underserved needs with better reach. One community partner shared an example from their prior collaborations using this approach, "*It was very innovative in that it was a group that was already trusted and they could act as a*

conduit. So the trust was there. They were delivering a product that the people were asking for. And since they could develop that relationship with trust, they could also take information about other things about vaccinations" (P004). They emphasized how "*all these different organizations, non-traditional, have fingers and relationships into the community that just the public health may not be able to reach, so really valuable*" (P004). Other community partners described the use of diverse stakeholders as critical to carry out change: "*It takes multidisciplinary teams to make change*" (P006). Another community partner shared, "*What I have liked about the work that we've done is involving different stakeholders. So obviously university has been a key partner, some of the hospitals, some of the other nonprofits, some of the ones that do work on social determinants of health have been at the table, some medical providers, that collaboration with the state, I think is real crucial*" (P001). Other diverse stakeholders that were recommended to engage in order to facilitate collaborations included "thought leaders" who were high positions of their agencies.

Effective and/or Frequent Communication. Another facilitating factor discussed was related to effective, consistent communication in the context of transparency and being upfront with one's priorities to assess whether there is alignment of interests as well as compatibility in partnerships. To that end, partners would be expected to have established a shared sense of commitment, which was considered critical to ensure meeting collaboration goals. Others discussed the need to communicate needs (as they are ongoing) to maintain relationships among and between partners over time: "*When we think about relationships and somebody walks away hurt and upset and I didn't tell them why I was hurt and upset, how can they do anything about my hurt and upset? It's all tied together*" (P007). One community partner placed emphasis on ensuring effective communication between community and academic partners to clarify roles

and expectations: "*Making sure we come to common language, simple things like 'how do we define community?', making sure that we're speaking the same language*" (P006). An academic partner reiterated and described common language as one's responsibility as researchers: "*It is our responsibility as researchers to make sure that there are good relationships, there is trust, and that in our common language, it provides an opportunity for us to share a vision goals and mission, because we both understand what they're saying*" (P002).

Characteristics of Partners. Of note, participants also discussed characteristics of their partners as facilitating collaboration. One community partner stated, *"We have a lot of issues going on in here, Flint, but we have a lot of good people with good hearts*," (P007). Characteristics, such as ongoing commitment and passion from community partners, were considered important to move equity work forward, "*The passion of people and people are more willing to participate in ways that they can,"* (P004). Partners also need to be reflexive with a willingness to examine one's own expectations to improve relationship among other partners: "*What was helpful for me [was] to rethink my own perceptions about expectations as it related to these areas,*" (P007). Other community partners believed that characteristics, such as having a history of working together, a shared sense of commitment to one another, and a willingness to work as a team, was needed in order to make any meaningful impact: "*You have to have that connection, that experience of working together, the sense of accomplishment that, you know, they have your back and you have theirs, and it is by taking tasks, and working on them and, and getting things done and accomplished, but that's, what's building your momentum, but it's also the team building that that's so important to the trust building"* (P006).

Theme 3. Facilitating Factors from External Influences

This theme captured factors facilitating the CAP related to COVID-19 or other external contexts. Overall, in these discussions, the impacts from COVID-19 were described as opportunities for the CAP and public health equity collaborations more broadly. Overall, COVID-19 had demonstrated how much existing relationships matter. All partners discussed the importance and relevance of having established relationships of trust and common language in order to face this crisis successfully as a collaborative: "*When you are in a crisis, then it makes it easier because you do have that common language you have that trust built that you can function better because you've had that shared experience*" (P006).

One consistent perspective shared among all partners was that COVID-19 was an opportunity that globally highlighted inequities for all leaders, agencies, and populations. This was believed to concretize the reality of inequities that may not have been shared among others outside of public health equity work in the U.S. One partner stated, "*COVID-19 shown a light on all of the things that we already knew were a problem*" (P006). COVID-19 was able to highlight pre-existing gaps and issues in health service, access, and treatment, directing the need for more data and social movement.

This, in turn, led to an increased level of support from partners, senior leaders, cross sector agencies (outside of health), policymakers, as well as increased support mandated from local and national policies. One academic partner shared, *"It was sort of all hands-on deck to see like how we can help"* (P009). The pandemic prompted senior leaders to access and share information as well as get involved in the effort for equity. Historically, the CAP had faced challenges in engaging more senior leaders to get involved in collaboration efforts but influences from COVID-19 generated more engagement to move toward a shared mission to address health

disparities. One community partner stated, "*I'm not going to say that this period of time has made it more difficult to move towards health equity because I think we're able to focus more on that because of the support*" (P005). Thus, there was an increased level of support for the mission to eliminate health disparities and increase public health equity, facilitating and moving the CAP's goals forward.

Circumstances from COVID-19 also influenced how the CAP was viewed by the general community and helped solidify its role to partnering agencies. One community leader shared that COVID-19 was also able to show the "*value of the work that we were starting to do at the [CAP]"* (P001). An academic partner shared a similar statement, describing this as an opportunity to show other partners who they [CAP] are and what type of support they can be for them: "*This extreme situation is providing the [CAP] with an opportunity to identify who we are, and hopefully solidify that in the minds of the partners*" (P002). By responding to the pandemic, the CAP demonstrated its potential in functioning as a supportive partner for CBOs in Flint: "*The pandemic, though awful, really has brought a better need of, to show what can really be done with us, looking at data, getting the data, and then getting out to partners*" (P001).

Hindering Factors

Three themes were found most salient across interviews: (1) hindering factors specific to the CAP; (2) hindering factors for broader public health equity collaborations; and (3) hindering factors from external influences. Subcategories within each of the broader categories are discussed in more detail below with illustrative quotes.

Theme 1. Hindering Factors Specific to the CAP

This theme captured details that described hindering factors to the case study CAP. Of note, participants discussed hindering factors as it related to the process of carrying out collaborations.

Some hindering factors discussed in interviews were related to unequal decision-making, which may have led to a high burden of activities among some partners but not others. For instance, one partner noted observations in the distribution of tasks, where "*some folks get asked, some organizations get asked a lot of and some do not*" (P009). Some CAP members were also not as engaged as others, presenting some challenges in inconsistent partnership. This also presented as issues with "smaller partners," where partners felt: "*It's almost like there's this core group of the leadership where, where none of those things [inconsistent partnership] is an issue. And then there's the other sort of partners where I think that that probably is still an issue*" (P002). This indicated some level of unequal engagement, decision-making, or inclusion. Other hindering factors were related to not engaging the right level leaders with decision-making power in their affiliated agencies. One partner stated, "*A lot of organizations would just send other staff with (and not to minimize that), but it wasn't the thought leaders and the active leaders of these agencies that needed to hear and needed to be involved*" (P001).

Another hindering factor discussed in interviews was related to unclear roles and functions of partners. Some partners discussed how there was lack of clarity in what roles every community partner would play in the CAP, with some community partners feeling confused about ongoing efforts. One community partner shared, "*What has been difficult for me is just trying to understand how everything is fitting together. I am not able to see that roadmap, we talk about it quite often in the meetings, but every time we talk about it, I forgotten some things*

and I'm having to relearn it and I'm having to reconnect the dots" (P008). Others shared similar observations regarding role confusion of community partners, "*It often seemed to me like the community partners didn't know what their role was and sort of who's responsible for what and what is happening*" (P009). Another community partner shared similar sentiments, noting how inconsistencies in participation of partners led to "*not having a sense of where we all are and where we want to get to*" (P006). Others viewed this challenge as a missed opportunity to understanding the extent of their potential impact on the Flint community, "*I still feel as though our partners don't know what we're here for, don't know what they can look to us for. I think on the, on the flip side... we don't know exactly the kind of relationship that we can have with our partners...We may have some ideas, but I don't think that we are fully understanding the degree to which we could have a combined impact*" (P002).

Another hindering factor, not listed in the quantitative DPQ, was related to the duration of time needed to get to a point of success or to generate tangible outcomes. Some partners highlighted how the CAP had faced "*frequent stops and starts"* or "*muddy periods*" in the work that had set constraints on the opportunities for partners to reach a certain level of comfort in their collaborative relationships with other partners. These delays were also impacted by shifts in leaderships and partnerships, potentially leading to a loss of partnerships or "*casualties along the way*" (P001). Another hindering factor not listed in the DPQ included challenges in accessing state-level data. One community partner shared how challenging it had been to access this information although they had been working with their state level partners. This was believed to be a hinderance to moving the equity work forward and something "*That's always been missing in our community*" (P001).

Theme 2. Hindering Factors to Public Health Equity Collaborations

This theme captured details that described hindering factors to the broader scope of public health equity collaborations beyond the case study CAP. Overall, all partners described the nature of CAPs as challenging given the work of health equity: "*If you're trying to make change, it's not always easy*" (P006), and "*Collaboration is always hard*" (P008).

Similar to barriers discussed prior that were specific to the case study CAP, participants identified involvement from "*top thought leaders*" as well as government sectors as a consistent hindering factor for other collaborations. Participants explained that key CAP representatives tended to also be engaged in other equity efforts with other affiliations, which potentially limited the extent of their involvement in any one effort: "*That's always a barrier to the work of equity in the community is people have, there's so many groups out there, so many committees and, and so many things that people can do*" (P001). Another community partner discussed how commitment to multiple equity spaces can feel overwhelming, as well as dilute the efforts: "*There's a risk of you going in multiple directions and some of them will be competing for your time. Then you end up not being spending quality time on any one or two of them*" (P008). Of note, one partner also shared how they were making intentional efforts to step away from their role as a CAP member to prioritize other health equity efforts.

Other hindering factors to CAP collaborations were related to lack of shared terms between partners. For instance, one academic partner emphasized how challenges in language used among collaborations between researchers and CBOs can lead to additional barriers: "*If you don't have the common understanding or common relationship, you're going to get inconsistent participation because people won't see the purpose of it or the need*" (P002). Partners underlined the importance of shared language in outlining what the overall CAP plans to achieve. Not

clarifying these details had the potential to derail the process to getting to health equity outcomes, "*There needs to be a roadmap for all partners to be on the same page regarding how things are going to get done"* (P008). Other community partners discussed hindering factors related to lack of shared terms or language as a loss in translation leading to inaccurate portrayals of community partners' perspectives. One community partner shared, "*Academics like to write about things that are wrong, not necessarily about things that are going well. And so those people [community partners] who are doing the hard work in the trenches have academics, writing articles about them, about this, that, and the other thing going wrong. They're not in the trenches with them to know what it's like*" (P006). There was also a noted disconnect between how academics move forward in their careers from these collaborations and what community practitioners continue to struggle with in the field.

Hindering factors related to inconsistent partner participation was also viewed as a barrier to collaboration outcomes, with some participants emphasizing its central role in CAPs: "*Showing up is 90% of the job*" (P005). One participant provided insight into inconsistent participation, explaining how some partners may not actually understand the potential value of their involvement and may also be overburdened by their own organizational responsibilities: "*I don't think people immediately realized the value that would come back to their agency. It was more like, well, I've got work in my agency. I can't go to your meeting… and not realizing this was OUR meeting*" (P004). However, consistent levels of participation from partners were considered critical to successfully carry out change through the CAP. One partner stated, "*If you get a certain level of buy-in from everybody agreeing to be at the table regularly, you can eventually drill it into the wall, but if you don't have everybody working together consistently, you just missed the opportunity to really drive anything home*" (P003).

To that end, inconsistent participation may also lead to unequal decision-making. That is, some participants viewed unequal decision-making as a direct result of not having the right people at the table. However, it was considered critical to maintain a certain level of participation, consistency of that participation across partners, as well as a willingness to distribute decision-making power across all partners. Others noted how unequal decision-making and inclusion can also lead to inconsistencies in what partners have to gain or lose in CAPs: "*We may not see that there is mutual benefit because we're all not getting the same thing*" (P007). Thus, there needs to be a clear demonstrated advantage for partners to participate and a willingness to use an equity lens that can balance inclusion, acknowledge differences, and come to a shared understanding.

Theme 3. Hindering Factors from External Influences

Hindering factors from external influences captured details that described hindering factors related to the fluctuating environment of COVID-19 or other community context surrounding the CAP's functioning. Generally, participants believed that the reality of public health equity collaborations would always face ongoing challenges from external influences, even when challenges were resolved and issues improved. Given this, external influences were viewed as most challenging: "*What has been most challenging is what we have no control over*" (P007).

Fluctuating Environment of COVID-19. With the onset of COVID-19, many partners described hindering factors related to carrying out equity work in the community while also making sure partners stay connected when face-to-face opportunities were restricted, as well as added constraints on building relationships with community members. While virtual forms of communication were useful in curtailing these challenges, participants shared concerns regarding

accessibility to community partners and the extent of genuine relationship-building. As one partner stated, "*The difficulty is not being able to get together in person and not necessarily being able to reach folks that aren't able to connect by zoom*" (P004). Maintaining communication with broader CAP members was also challenging because of the overburdened experience on community leaders, as well as personal strains from the pandemic. One community partner shared how the pandemic had shifted their priorities to support their organization to stay afloat rather than the CAP efforts. Other hindering factors related to COVID-19 included challenges in trying to identify and provide more resources as a response to community needs. Other participants noted how the recent shifts from the CAP in response to COVID-19 were primarily focused on addressing community partners' engagement, needs and priorities rather than academic partners, potentially reducing the leverage of partnerships.

Another hindering factor that was frequently discussed related to not having a contingency plan in place for the CAP. In retrospect, two community partners discussed how not having a contingency plan or a crisis response structure with the CAP or broader research center caused great delays in shifting the purpose and goals of the CAP. There was no plan in place to instruct the CAP on how to maximize relationships through the partnership without facing great losses in the context of a crisis. This suggests that having a contingency plan in place for CAPs to respond to crisis and public disasters may be a helpful strategy to sustain public health collaborations facing a crisis in the future.

Community Context. Community context captured hindering factors that described the aspects of the community that influenced the CAP's functioning, including the history of collaborations, political backdrops, distrust, and navigating other cultures embedded in organizations or in community-based settings.

Many participants described hindering factors related to the history of collaborations in Flint. Prior to the centralized efforts of the CAP's broader structure, there were redundancies in what partners were doing. That is, CBO agencies had a history of carrying out work insularly and functioning in silos: "*A consistent issue within Flint is little pockets of people working individually or working with smaller groups instead of an organization coming in and looking at service providers from a macro view of Genesee County or even broader*" (P002). Having a history of functioning in silos had led to "*unnecessary duplication, unnecessary competition, and a host of things that really become nebulous because nobody really benefits from them*" (P005). Some even shared how this may have fostered a sense of competition instead of collaboration that may have led to inequitable funding opportunities and influence among organizations.

Another hindering factor related to community context included distrust. One partner discussed how there was a strong sense of distrust in the Flint community, particularly for any outside public health efforts as well as between academics and community partners. Given the history of Flint's water crisis, distrust in the community continued to remain a challenge; this was especially true when trying to spread information regarding COVID-19. One participant shared, "*When you think about our community partners, they've had so many negative experiences. Now, how can they have faith that the academics and the institutional partners that are partaking in this process can be trusted?*" (P006). These issues led to ongoing challenges in ensuring academic, institutional, and community partners had equal influence and resources. Participants emphasized how there is a critical need to address barriers related to lack of trust to create an effective CAP: "*if the partnership isn't firmly developed in terms of its relationships and transparency in the motivations and all of those kinds of things, if that isn't established, distrust will just kill it*" (P005).

Other barriers that were discussed included the political backdrop of the Flint community and country overall. One participant emphasized how changes in state level officials had historically impacted efforts in moving public health equity forward simply because these new officials may not have the same priorities regarding the needs of community. Participants also described issues related to navigating organizational barriers for public health equity efforts that may have made it more challenging to move forward. A one participant stated, "*There are structural and institutional challenges that create the barriers for good community academic partnerships. So unless some of those structural barriers are dealt with, you're going to always have a challenge*" (P007). Another participant highlighted how there are additional barriers in the culture and system of communities, suggesting that partnerships need to approach communities as multi-systemic rather than as a unified unit.

Motivations

Community Partners

Many community partners felt motivated to join the CAP because of its alignment with their affiliated organization's vision and effort to move forward with an equity lens. These partners shared how their organizations had "*equity at the forefront*" in all efforts, which also aligned with other partnering CAP agencies. Other partners emphasized how the CAP aligned specifically with their affiliated organization's principles to prioritize collaborations with community agencies in order to make an impact. Community partners also stated that these were important motivating factors to continue to stay engaged in general.

Partners also described motivating factors related to the idea of collaborating with other community agencies. Overall, partners recognized that complex community problems "*cannot be solved alone*" (P006). Accordingly, one partner felt motivated in the "*promise of bringing*

together various community agencies and stakeholders to improve health in Flint" (P005). Others shared that the CAP's structure facilitated the ability to create a collective voice that could be facilitated through the CAP, as well as develop good relationships and "*actually make progress with other sectors*." One partner shared, "*the idea that there could be a place that would bring us together, so we move forward together and we're not competitors instead we're collaborators was really attractive to me*" (P004). Thus, some felt motivated because they believed the CAP and its broader research center would help alleviate challenges to collaborating with other community providers by functioning as a bridger and providing those meeting opportunities to come together for a common objective.

Several partners also described motivating factors related to the need for a systematic process for adopting and using new evidence-based practices to move health equity forward. Some participants discussed this in the context of needing a systematic process to adopt and use those evidence-based practices within their own agency. Others discussed this in the context of sustaining efforts in Flint over time. Notably, participants discussed the importance of sustaining evidence-based systematic processes (and the administrative support therein) to improve health disparities due to the historical experiences with research in the community. Participants shared: "*It [research] falls away after the initial research is done*" (005) although it may seem promising for what the community may need at a given time. The participant elaborated, "*I was very disappointed that there were so many research programs that had been done in Flint and after the research program was over, that was pretty much the end. So that's what inspired me to want to do this...*" (P005).

While not listed as a motivating factor on the quantitative DPQ, many community partners described other motivations related to having a personal mission, sharing their historical

perspective for future leaders, and potential benefits gained from their involvement. First, several partners believed they had a personal mission to take on their roles as leaders in identifying health equity solutions in the Flint community: "*As a citizen of the community, I have certain responsibilities that I need to fulfill*" (P008). Others shared how they felt a sense of duty to carry out the work that needs to be done in order to ensure equity and quality of life within the community. As one partner stated, "*We have to make sure that those that are most vulnerable are provided assistance and support*" (P006); others felt similarly about other underserved populations, including frontline workers. Relatedly, other partners were driven by their passions to serve for equity and hope to see those efforts reified in the Flint community: "*I am passionate about health equity and those are things that I want to see advanced*" (P004). When asked about what kept partners motivated to continue engaging with the CAP, participants shared wanting to continue moving their personal commitment towards health equity as well as supporting the community along the way in order to see the outcomes: "*I want to see that happen*" regardless of their formalized roles or affiliations.

Additionally, some participants shared that they were motivated by the idea to train and mentor new health equity leaders through their collaborations. For example, one participant shared how they continued to stay involved to "*be able to offer history and facilitate collaboration*" (P004) for younger people and people who historically had not been at the table up to that point. Another shared similar sentiment, emphasizing *"I think it's best to get new blood...somebody with different ideas, new ideas, maybe younger...So, we'll let somebody else come in and pick up the baton...*" (P008). Another participant emphasized how their historical perspectives had contributed to persistence in health equity efforts overall, "*I think as we're getting a little bit older and some of us are more and more senior years, it's a little bit more*

difficult to stay at the table because you don't have the same level of energy, but that commitment generates the desire to stay there and work it out" (P007).

Other motivating factors were discussed as potential gains that could be obtained through CAP involvement. For instance, one community member felt motivated by the opportunity to build their knowledge and skillset in understanding dissemination and sustainment in order to apply it in practice. Another felt that their expertise added value to the CAP and helped bridge connections to other historically marginalized populations. Others felt that they would be able to provide more community context, gain knowledge, and prioritize community needs through their involvement: "*Why shouldn't I put that to… that skill set to work to help the community and on the long-term help myself?"* (P008). Another participant discussed gaining more resources through the collaboration, "*There are things that the university has that it can bring to the table that as a community partner I don't have the resources*" (P007). Even still, others found the relationships with other CBOs fulfilling and were driven by the opportunity to gain trust of their collaborators to the point of becoming "*cherished friends*" (P005).

When asked about what continued to keep community partners motivated or engaged with the CAP, two participants were excited about its potential growth as "*progressive and forward thinking*" particularly with what it was able to demonstrate during COVID-19 with its core leaders. Another participant believed in the potential of the collaborative to lead to higher levels of systematic processes for improving health equity overall in the Flint community. Of note, some participants shared details on not feeling motivated to continue staying engaged. One participant shared that they felt the need to lessen their involvement with the CAP because they were overwhelmed with many of the efforts occurring simultaneously in the community. Another participant felt challenged by the shifts in CAP leadership as well as the impacts from

COVID-19. Yet, they still wanted to forge ahead: "*We've got to somehow get the energy in a community that's already exhausted to forge ahead with more energy*" (P006).

Academic Partners

Academic partners primarily discussed motivations related to having shared missions with the CAP, potential benefits, and having a sense of community. Both academic partners were motivated by the shared missions to reduce health disparities: "*There were overlapping interests in what [the CAP] was doing and what we [research team] were doing*," (P009). Academic partners emphasized the mutual benefits in gaining the opportunity to apply their prior experiences as researchers, gain professional development, while also advance the potential to maximize impact for existing community-based research projects. For instance, one partner shared excitement to apply prior training into practice, describing it as a "*natural connection*" (P002). From a more historical perspective, some partners were motivated to join because of the CAP's potential to centralize efforts in Flint and raise awareness about what other community and academic agencies were carrying out in the community, which in turn, may reduce the redundancy that had been noted from prior years. Other motivations were related to missing connections to the community and wanting to be part of the community established in prior work: "*This is really something that I've always wanted to be a part of, something that I was a part of before*," (P002). When asked about what kept them engaged with the CAP, academic partners emphasized seeing real world impact in the elimination of public health disparities either on their own work or the broader Flint community.

CHAPTER 4: DISCUSSION

Summary of Findings

Understanding community and academic partner's perspectives on collaboration efforts and dynamics of their relationships is important to move health equity forward. The current dissertation project was designed to contribute to the literature on CAP perspectives by exploring motivational factors that drove partners to participate in CAPs and explore how such factors impacted the collaboration process and outcomes. A closer examination of motivating factors, as well as strengths and challenges that lead to collaboration outcomes can help develop strategies to strengthen partnership dynamics (Varda et al., 2008a; Varda et al., 2012). The current project used a case study of a CAP that included 25 community and academic partners from organizations with key representatives who were leading public health equity efforts in the Flint community. Using social network analysis, the project explored the overall structure of the network, connectivity embedded in the network, position of partners, and quality of relationships. Semi-structured interviews were then used to expand on the quantitative data to contextualize facilitating and hindering factors to collaboration, as well as motivating factors to join and continue participating in the partnership. Through the use of both case study and longitudinal mixed methods approaches, results provided an in-depth assessment of factors that contributed to or hindered the growth of the CAP network, along with the community and academic perspectives of partnering organizations. Further, the study examined changes across two different time-points, allowing for a closer examination on how external influences from fluctuating environments (e.g., community contexts and COVID-19) may change a partnership over time. In the following section, a discussion of findings is provided, organized by research question, as well as the methodological limitations that should be considered when interpreting

results. The chapter concludes with a summary of implications for the field of community psychology, practice, and policy.

RQ1. What Factors Facilitate or Hinder the Development of CAPs Over Time?

Facilitating Factors

Facilitators to CAP collaboration were examined using both quantitative and qualitative data collection approaches to understand underlying processes of the CAP from community and academic partner perspectives. Quantitative results revealed that the majority of CAP members endorsed facilitating factors related to having good relationships between partners, communicating mutual benefits for all partners, and maintaining respect. Qualitative findings expanded on these details and contextualized responses with illustrative examples. For instance, many community partners emphasized how having prior and positive relationships with partners greatly mobilized collaboration efforts by encouraging members to join the CAP because of someone else they had worked with or by relaying information generated from recent CAP efforts (e.g., COVID-19 resources or webinars). This is consistent with extant literature on facilitating factors to CAPs that demonstrates strong evidence for the value of prior existing relationships with partners in facilitating collaboration by offering practical advantages in reducing amount of time needed to build relationships and trust from the ground up (Drahota et al., 2016; Mizrahi & Rosenthal, 2001; Nyström et al., 2018). These studies have also shown that having previous collaborations is a strong predictor for fostering collaborative activities across partnering organizations (Lasker et al., 2003; Mizrahi & Rosenthal, 2001). Furthermore, triangulation of quantitative data with the qualitative interviews helped clarify that partners were reporting on facilitating factors specific to the CAP and facilitating factors to broader public health equity collaborations. Facilitators specific to the CAP included having good quality of

leadership, strong infrastructure to support relationship-building opportunities, having good relationships, and having shared vision, goals, and or mission. Facilitating factors for broader health equity collaborations included sharing equitable power, good quality of relationships, putting in early work to develop those relationships, assuring mutual benefit for all partners, value of innovation and diversity of partners, maintaining effective and/or frequent communication, and attention to characteristics of partners These findings call attention to factors that were not captured in the DPQ, but were found salient to CAP members, specifically factors related to ensuring equity amongst all partners, as well as innovative collaborative thinking to incorporate more diverse organizations into public health efforts. Some literature has demonstrated the value of diverse stakeholders in optimizing CAP efforts, as well as mobilizing social action (Lasker et al., 2003; Litt et al., 2015; Suarez-Balcazar et al., 2005). These findings also add to the literature on CAPs carried out specifically within historically marginalized settings. For instance, partners viewed the infrastructure of the CAP as a facilitating factor that created a safe environment to build relationships with other partners as well as attempted to maintain transparency in its broader procedures. The infrastructure of a collaborative has been indicated as an important factor among communities with a history of marginalization to foster genuine relationship-building among partners (Abdulrahim et al., 2010; Castaldo et al., 2010).

Hindering Factors

Overall, quantitative results showed that the majority of partners viewed unclear roles and/or functions of partners and inconsistent participation or membership as challenges to ongoing collaboration efforts at time-point 1 with the addition of mistrust**,** poor communication and excessive time commitment between partners at time-point 2. Similar to discussions on facilitating factors, participants described hindering factors specific to the CAP as well as to

broader public health equity CAPs when asked to expand on quantitative responses. Hindering factors specific to the CAP focused on unequal decision-making, unclear roles, and duration of time needed to see concrete outcomes. These frustrations align with prior literature on public health driven collaboratives related to the amount of time needed to see positive changes in their communities (Aarons et al., 2014; Chaskin, 2001; Coviello, 2005; Lantz et al., 2001; Provan et al., 2004; Trotter et al., 2015). Hindering factors specific to broader public health equity CAPs included limited engagement from higher level stakeholders, not having a shared language between partners, and unequal decision-making. During the interviews, community partners described how key decision makers from community partnering organizations were often not the ones attending meetings; rather, other staff were sent in their absence. This highlights a need to define roles and responsibilities of partnering organizations, directors, and their proxies or coordinators to ensure for efficiency and accountability, while also emphasizing the importance of stakeholders or organizational representatives with decision-making power in order to move CAP efforts forward. Partners also expanded on hindering factors related to role confusion and establishing a common language. Specifically, academic partners perceived "research" as a language that didn't necessarily translate well into community settings, which then led to missed opportunities in promoting their participation in ongoing events or programming because the purpose isn't clear. Importantly, academic partners also recognized existing barriers among CBOs and other university collaborations, where some CBOs may be providing a service or program from an academic institution regardless of its quality, to utilize the funds that are offered for adopting the innovation into their settings.

However, actual benefits to the community (outside of financial support to the CBO) are not made explicit. This is important to note because it may tie in with the growing sense of

mistrust among community partners questioning the intentions of academic institutions entering their local areas (Abdulrahim et al., 2010; Castaldo et al., 2010). That is, some academic institutions may be offering funds to coerce CBOs into using the innovation for the sake of maintaining their organizational capacity.

Prior studies examining academic partner's perception of collaboration research have also suggested challenges related to adaptations in translating projects and their demands into the community context (as opposed to academic settings) (Garland et al., 2006; Gomez et al., 2018; Nyström et al., 2018). These findings extend to adaptations needed in communicating the purpose or goals of potential projects and in translating the impact of research in a way that is relevant and clear to CBOs' context. This also points to the value of responsiveness and flexibility to adapt and prioritize community context to minimize barriers to collaboration outcomes. Taken together, these quantitative and qualitative findings contribute data on factors that facilitate and hinder CAPs, as well as expanded contextual descriptions of these factors from community and academic partners' perspectives. Overall, these findings can be useful in guiding decisions for improved collaboration efforts.

How Did External Factors Related to COVID-19 Influence the CAP?

Using qualitative and quantitative data strands, the study also examined external influences related to the fluctuating environment of COVID-19 or other community contexts surrounding the CAP's functioning. Qualitative interviews with core CAP leaders elaborated on the CAP's community context, imparting details on how COVID-19 had impacted the interpersonal, perceptual, and operational processes at a 6 month point after stay-at-home orders were in place during 2020. Overall, efforts to redirect or shift the CAP aligned with its core operating principles prioritizing community voice and taking collective action to address

community needs. COVID-19 also forced core leaders to think creatively to identify alternate ways to continue building relationships without overburdening partnering CBO representatives.

In light of COVID-19 circumstances, partner interviews described how the pandemic highlighted: (a) the importance of existing trusted relationships in navigating challenges, (b) increased level of support across agencies, and (c) how the pandemic shaped the role of the CAP as a source for support throughout this period. In terms of barriers, qualitative findings with partners described how COVID-19 had compromised many partners' availability and commitment to move forward with the CAP's agenda. Some participants shared how their focus shifted to making sure their organization's employees would not lose their jobs. Moreover, other participants had taken on new roles to lead additional efforts to support CBOs engaged in COVID-19 service provision, vaccinations, or promoting education. For instance, one CAP member took on a role as part of a COVID-19 task force to address inequities; another CAP member took on a role that focused on training community health workers to promote health knowledge about COVID-19 symptoms and treatment. These details may explain why excessive time commitment was a prominent hindering factor identified in the survey at time-point 2. These findings are aligned with CAP literature, indicating that partners in one collaborative are often engaged in different cultures, including roles, sectors, and/or other initiatives (Trotter et al., 2015). Even still, these findings may be useful for public health leaders driving collaborations in the context of fluctuating environments by providing insight into how factors may influence partnership dynamics during times of crises.

Existing literature asserts that social networks can play a significant role in supporting CBOs during times of crises and function as a source of resilience (Varda et al., 2009). However, the impact of networks in these contexts is contingent on the timeliness of response and the

extent of collaboration from local, state, and federal agencies (Stewart et al., 2009). As evidenced in the CAP leader interviews, the CAP network attempted to respond to the needs of community partners by carrying out a needs-assessment, providing funds without obligations, and even scheduling brief meetings with CBO representatives to communicate that the CAP was there as a source of support. Additional attempts were made to engage local and state policymakers to create policy reports and disseminate information that community partners could trust. Furthermore, while COVID-19 was an unprecedented crisis, Flint community partners shared how their historical experiences and perspectives prepared them to face a crisis again with collective community in mind. This extends to literature supporting how resiliency in response to disasters can be embedded in the collective effort of a network, working together toward action-oriented solutions (Ahuja et al., 2012; Mizrahi & Rosenthal, 2001). It is strongly believed that Flint is a prime example of a community that has revitalized itself through its own citizens and community assets (Hailemariam et al., 2021). For example, CAP leaders and partners depended on their prior relationships to the Flint community in order to navigate barriers in accessing partners or distributing resources to partners in need. Thus, it was important to "*rely on relationships that your partners already have*." Taken together, these findings suggest that flexibility, responsiveness, and prior relationships are particularly important for the sustainment of a CAP navigating a crisis.

How Have These Factors Changed Over a Year?

Of note, the number of endorsed facilitating and hindering factors increased from time-point 1 to time-point 2 for both community and academic partners. Additionally, academic partners tended to report a higher number of facilitating and hindering factors than community partners at both time-points. This might indicate differences in how community and academic

partners were perceiving the CAP's efforts and prioritizing different aspects of the partnership. For instance, when asked whether any challenges had been resolved or worsened over time, academic partners highlighted how the decision to shift CAP activities in response to COVID-19 was more community focused rather than collaborative, potentially reducing the leverage of partnerships. However, community partners believed the CAP showed improvements in attending to community needs. While the reiteration of the CAP was challenging, it still attempted to adapt and adjust to its fluctuating environment. Prior studies have asserted that factors influencing the effectiveness of a collaborative can evolve over time (Butterfoss et al., 1996; Provan et al., 2003, 2009). In this case, the CAP demonstrated dynamic changes resulting from its surrounding environment with some facilitators to the CAP changing their nature and functions, particularly in the context of a crisis. Some literature has challenged the negative connotations associated with these iterations of partnerships and has upended the narrative to relate such dynamics as indicators of "resilience, creativity, and fortitude" (Mizrahi & Rosenthal, 2001, p. 13; Provan et al., 2003). This carries important implications for maintaining a CAP or other forms of public health collaborations over time. Given this, CAP leaders and researchers are advised to stay mindful of this evolving nature of CAPs when implementing strategies for a program, practice, or theory.

RQ2. How Do Network Outcomes Change From Time-Point 1 to Time-Point 2?

Summary of CAP Network Outcomes

Exploratory SNA was used to identify the CAP's network outcomes. On average, partners in the CAP network had collaborative ties with 11 other CAP members at time-point 1 and 9 other CAP members at time-point 2. The network diameter was only 3 across both time-points, indicating that a resource (e.g., information, such as a brief or newsletter) can travel from

one CAP member to any other member by no more than three paths (Wasserman & Faust, 1994). Of note, more than 50% of all possible triads (transitivity) were established, suggesting a generally well-connected network structure over time. Overall, these findings indicate that the CAP was fairly close to one another, reflecting a small world structure with the potential to relay information or resources quickly (Ahuja et al., 2012; Wasserman & Faust, 1994). While no changes in the network diameter were observed from time-point 1 to time-point 2, these indicators of network connectivity carry important implications for existing and ongoing collaboration efforts. For instance, key leaders may take advantage of the small world network structure by prioritizing efforts to spread accurate and reliable information regarding the COVID-19 vaccination.

Network density measured the extent of the CAP's overall cohesion decreasing from 27% to 23% from time-point 1 to time-point 2. Network density can be used as a proxy for collaboration, detailing how well-connected CAP members were and can also be used to determine the likelihood of successful outcomes from collective action (Celentano, 2010; Marwell et al., 1988; Retrum et al., 2013; Valente et al., 2015; Wasserman & Faust, 1994). This decrease in network density indicates that there was a smaller number of relationships endorsed at time-point 2. However, while the number of overall ties decreased, the quality of relationships that were endorsed demonstrated higher levels of trust, value, mission congruence, openness to discussion, resource contribution, power/influence, and involvement.

Changes in network density can be an indicator of network dynamics (Ahuja et al., 2012). If the CAP illustrated higher network density over time, then these changes could potentially be associated with normative behavior and standards (Ahuja et al., 2012). Therefore, the CAP's structure may not have developed standards to maintain relationships over time. This is a

possibility as some partners shared challenges related to lack of clarity and lack of structure in setting agendas during qualitative interviews. In some cases, more density can indicate the likelihood of more effective pathways of resources, information, and communication than networks with low density (Valente et al., 2007). In other cases, less can mean more. Some studies have challenged this notion by proposing how too much density can restrict resources, communications or other forms of innovations outside of the existing network and not actually lead to effective collaboration regardless of the high number of ties (Hansen, 1999; Jasuja et al., 2005; Valente et al., 2007). Higher rates of network density can also indicate homogenization of ideas or behaviors, potentially minimizing the diversity of perspectives that can generate innovation within a collaboration (Ahuja et al., 2012; Granovetter, 1973).

Changes in network density should be considered with the quality of those relationships. That is, while network density was lower at time-point 2, the level of collaboration reported for these existing ties increased, as well as the frequency of communication. It's possible that having more coordinated relationships with other CAP members may have integrated more diverse perspectives or norms, which would display a lower network density, but richer collaborations. A preeminent theory on "weak ties" has asserted that there is a form of cohesive power found in weak ties, particularly in networks with a large number of triads (Granovetter, 1973). Other literature has placed greater emphasis on existing opportunities between weak ties to increase connections, knowledge sharing, and build relationships (Celentano, 2010; Fredericks & Durland, 2005). Grounded on these theoretical assertions, the results from the CAP suggest that weak ties (e.g., conceptualized as a lower number of network density with a moderate rate of transitivity) found in the network still generated greater collaboration outcomes, in terms of collaborative activities, frequencies of communication, and perceived trust and value.

Results on the overall connectivity of the network indicated that while network density decreased, there was more quality embedded in these ties, the network diameter remained considerably low, and measures of transitivity were moderate. Accordingly, the theory on the strength of weak ties would suggest that these other measures can be indicators of strength rather than just the number of relationships in a network (e.g., density) (Granovetter, 1973). That is, CAP members may be relying on relationships that aren't as frequent or as vast but function as an important contributor to their identity as a CAP member, value, or sense of purpose. Given the role of partners in health-related sectors and non-profits, it's also possible that the community context and shared experiences of community hardships had contributed to a deeper sense of trust and value of partners who were already engaged in the Flint community.

Node-level measures were used to examine the positions and influence of individual partners in the CAP network. Of note, the study provided undirected and directed network ties in order to gain a more comprehensive illustration of members' roles both considering the direction of the relationship in the directed network and only attending to presence or absence of ties in the undirected network. Extensive network literature explains how SNA measures can be used to conceptualize a node's (e.g., partner) status and position, such as prestige, and guided interpretation of findings (Marsden, 1990; Valente et al., 2015; Wasserman & Faust, 1994). To start, degree is considered the simplest measure for prestige (e.g., number of nominators) (Krackhardt, 2003; Wasserman & Faust, 1994). CC-GHP and NCAAHC both maintained the highest degree at both time-points, suggesting that these two agencies had more prestige than others in the CAP and played a stronger role in fostering relationships with others. CC-GHP and NCAAHC were also key core leaders driving decision-making of the Partnership Consortium, along with the academic PI and co-PI (PCC).

Centrality indices, including betweenness, closeness, in-degree centrality, and out-degree centrality, were used to examine which partners were most central (or influential) in the CAP (Freeman, 1979; Wasserman & Faust, 1994). Betweenness centrality can identify partners (bridgers) who play an integral role connecting partners and as a relaying point to pass information and resources from one partner to the next, which can inform the extent of power over a collaboration path (Freeman, 1979; Wasserman & Faust, 1994). For the current study, CBOP and GCHD remained important bridgers over time, suggesting that these two agencies played an important role in building relationships between any two members in the network. A wider scope of literature on betweenness centrality suggests that bridgers maintain connections with others who would otherwise be disconnected to the collaboration network completely (Freeman, 1979). Of note, CBOP was not a traditional health-related organization and may have functioned as a bridger between CBOs or non-profits, making them an essential collaborator to the broader Flint community. GCHD was a health department that remained engaged with the CAP throughout the pandemic by participating in community webinars and sharing resources on testing sites and updates, as one would expect from a health department. During the interviews, the key representative from GCHD described their role as "more with the community and knowing the partners." These findings carry strong implications for the CAP's collaboration efforts and can be used to inform strategies to maintain partnerships by leveraging bridgers in CAP networks.

According to closeness centrality measures, AMC and NAACP were the closest to other partners in the network across both time-points. Closeness centrality builds on the assumption that important nodes are close to other nodes and is considered a more stable measure for determining which partner is closer by the average distance to one or more partners from the rest

of the network (Freeman, 1979; Krackhardt, 2003). Theoretically, partners with the highest closeness centrality (of note, smaller scores are better) are arguably the ones that can reach or access other partners with fewer steps (Freeman, 1979; Krackhardt, 2003; Wasserman & Faust, 1994). Thus, if one is centrally close, then it can quickly interact with others, facilitating their productive collaboration (Wasserman & Faust, 1994). However, if a node grows farther in distance, its influence or potential then decreases (Wasserman & Faust, 1994). These findings suggest that AMC and NAACP were considered key productive collaborators because these organizations could easily reach other agencies within the CAP (Luque et al., 2011; Valente, 2010).

While it's important to examine which relationships are strong in a network, it's equally important to examine which relationships are "weak" to determine whether these ties should be maintained as is or strengthened for better collaboration outcomes. One example of this can be shown when rates of lower degree are examined more closely. Partners who reported the lowest degree scores in the CAP indicated lower levels of collaborations than those with higher degree scores. For instance, at time-point 1, AMC demonstrated one of the lowest degree scores, but was considered one of the closest members to other partners in the CAP. This can be a particularly important detail to expand on if a key leader is hoping to identify areas for growth that would foster not only that direct relationship with AMC, but also improve relationships among AMC and other partners near them. AMC could also be integral in spreading information, resources, or other tangible products that may be relevant to the CAP's health equity efforts. The same can also be assumed about AVE at time-point 2, where low degree scores were observed, but higher rates of closeness centrality were reported.

Degree centrality was calculated by two indices, including in-degree and out-degree centrality (Wasserman & Faust, 1994). GHP, GCHD, and UMF had the highest in-degree centrality across both time-points, suggesting that these agencies were more frequently sought out as collaborators from other members in the CAP. In-degree centrality can be an indicator for popularity (Valente et al., 2015; Wasserman & Faust, 1994). NCAAHC and GCHD had the highest out-degree centrality across both time-points, informing the extent to which these agencies were working with partners across the network. Out-degree centrality can be an indicator for expansiveness (Wasserman & Faust, 1994). Both measures were used to highlight the level of influence partnering agencies might have in the collaboration, as well as their potential for sharing information or resources.

Changes in degree centrality are associated with potential benefits that can indicate higher status, prestige, influence, or accessibility to information, services, or resources (Ahuja et al., 2012; Wasserman & Faust, 1994). Other literature posits how changes in degree centrality can indicate a wider breadth of collaborators (Mays & Scutchfield, 2010). At time-point 2, GFHC appeared as an influential partner with one of the highest rates for in-degree centrality; GHP reported one of the highest rates for out-degree centrality. Aligned with the network literature, these findings suggest that GFHC and GHP may have taken on a more central role in disseminating or promoting access to resources throughout the pandemic, which may have made them more relevant collaborators to access for equity solutions, as well as verifiable information regarding COVID-19. Overall, understanding social ties resulting from participation can also be viewed as proximal outcomes to CAPs (Lasker et al., 2003). These findings have strong implications for how power is distributed among organizations, as well as practical information on opportunities for increasing or maintaining collaboration efforts.

Moreover, network theories related to opportunity and inertia may explain the collaboration patterns observed in the current study (Ahuja et al., 2012). Opportunity refers to a micro foundation that explains network behaviors in the context of proximity or convenience (Ahuja et al., 2012) and shared characteristics between members. For instance, many CAP members shared organizational missions specific to health equity, as well as prior existing collaborations with one another in the Flint community. According to opportunity, the network patterns would be explained by trust and convenience, where a member is likely to collaborate with someone because prior collaborations fostered trust or because they're already carrying out similar programs or services. This perspective highlights the importance of having a sense of community in CAPs and collaborations, as well as how a sense of community can potentially influence organizational function. An alternative viewpoint can also be explained by "inertia," particularly for the second time-point that occurred during the COVID-19 pandemic. Inertia is manifested through network patterns that are established or persistent simply because of routines, norms, or habits (Ahuja et al., 2012). In this case, some ties in the CAP at time-point 2 could have persisted simply because collaborating had become an organizational norm or routine. In the context of Flint, a community where collaborations are prioritized, norms could potentially explain the ties maintained throughout the pandemic.

How Do these Network Outcomes Vary by Partner Type?

To examine variations in network outcomes by partner type, the study collected quantitative and qualitative data on partnership outcomes. Network outcomes related to resource contributions, value and trust by partner type were examined using visual sociometrics (See Figures 3 – 7).

Partnership Outcomes

Findings from the current study examined resource contributions made to the CAP by first summarizing which resources were contributed to the network, as well as changes in the total sum of resources contributed over time. Resource contributions selected for the current study were grounded on literature summarizing resources that are typically exchanged within a public health collaboration (Gazley, 2008; Saidel, 1991; Varda et al., 2012). Findings indicated that CAP members tended to contribute a wide range of resources, ranging from community connections, information/feedback, in-kind resources, and health expertise. Of note, academic partners consistently contributed funding to the CAP, whereas community partners tended to contribute less resources related to funding, such as paid staff, fiscal management. This is consistent with prior literature that shows funding as a common resource that remains needed for CAP success (Chapman & Varda, 2017; Lasker et al., 2001; Retrum et al., 2013; Weiss et al., 2002). These findings also demonstrate the diversity of resources provided from partnering agencies to support the CAP's goals in addressing health disparities. Diverse network contributions to a CAP can be interpreted as more breadth of partners (e.g., extent of variation). Prior literature has suggested that collaboratives with more breadth will typically have more diverse resource contributions, which can drive successful collaborations (Mays & Scutchfield, 2010). In tandem with other CAP literature reviewed, these findings suggest that a broader set of resources are needed in order for a CAP to function successfully and move toward goals. These results underline the importance of interorganizational collaborations that extend beyond organizational boundaries and the value of working together to access different resources to meet varying community needs.

Partnership outcomes are directly related to a CAP's function and are central to network activities (Chapman & Varda, 2017; Litt et al., 2015; Retrum et al., 2013; Vandevanter et al., 2011; Vangen & Huxham, 2012). Resource contributions, in particular, can also function as determinants to partnership synergy and influence partnership functioning (Lasker et al., 2001). For instance, partners who occupy positions of high degree centrality potentially have more access to resources and more influence within a network (Freeman, 1979). Other studies indicate that partners who are more active tend to see more benefits to the collaboration (Lasker et al., 2001). Organizational characteristics, such as sectors, may also play a role in what an organization could potentially contribute to the CAP (Nowell & Foster-Fishman, 2011). Future studies are urged to examine the extent to which partnerships use resources efficiently, as well as satisfaction with quality of those resources.

Quality of Interactions

The current study examined quality of ties as it relates to levels of collaboration and frequency of communication in the CAP network. Regarding level of collaboration, quantitative results showed a large percentage of cooperative and integrated levels of collaboration among CAP members. Percent change calculations in reported levels of collaboration from time-point 1 to time-point 2 indicated a 39% increase in cooperative activities over time. Literature on level of collaborative activities have considered cooperative relationships as the strongest predictors of systems change outcomes (Nowell, 2009). This can be extended to public health CAP efforts attempting to resolve health disparities across systems, such as the current case study. Moreover, while coordinated and integrated levels are, indeed, higher forms of collaboration, having such high levels of collaboration can sometimes be counterproductive. Other studies specific to investigating social networks have found that more densely connected networks may not always

function better than less densely connected networks (Jasuja et al., 2005; Valente et al., 2007). Thus, coordinated levels of collaboration are considered more ideal and manageable. Future studies are encouraged to examine which level of collaboration is most important for maintaining relationships for full participation of community partners and strategic allocation of resources.

The extent of collaboration between academic and community partners (or practitioners) is contingent on their willingness and ability to communicate (Palinkas et al., 2009; Varda et al., 2009; Varda & Retrum, 2012). Communication is particularly important because it provides partners with the opportunities to build relationships and exchange resources (Honeycutt & Strong, 2012). Given the importance of communication, the project also examined changes in communication frequency in the CAP network. Findings found that the majority of partners reported monthly forms of communication at time-point 1 and then weekly communication at time-point 2. Percent changes showed that weekly, more frequent forms of communication increased greatly over time. These findings suggest that while the network first maintained monthly forms of communication with partners via meetings or newsletters at baseline, communication increased throughout the pandemic. This can be explained by CAP leaders' efforts to implement a community webinar in collaboration with another research center, whereby CAP members were invited as panelists to share information related to COVID-19 from their organization.

Prior studies have suggested that communication among collaboratives represent an aspect of social capital (Foster-Fishman et al., 2001; Honeycutt & Strong, 2012; Nowell & Foster-Fishman, 2011). Significant evidence also asserts that collaborations can be integral in building social capital by fostering relationships that promote access to resources or information or offer some benefit to the individual, organization, or community to carry out an action

(Borgatti et al., 1998; Lasker et al., 2003; Nowell & Foster-Fishman, 2011). For collaborations to initiate and sustain over time, it becomes considerably important for a CAP to create an environment that encourages communication among members. While the study did not examine whether members were satisfied with the communication strategies utilized in the CAP, core leaders seemed to encourage communication during COVID-19 by creating various products for feedback and to promote accessibility for questions or concerns. For instance, core leaders developed a quarterly newsletter that featured a community partner, but also included their contact information, clear and explicit details about each role of members in the core leadership team, opportunities to take part in planning committees, and primary contact information of the academic co-PI to reach to provide feedback or suggestions.

Value and Trust. Other indicators for relationship quality were used to examine value and trust (using PARTNER Tool indices) of the overall CAP network and among CAP member relationships. At the whole network level, the CAP demonstrated high levels of shared mission congruence, trust, openness to discussion, value, power/influence, and involvement at both time-points. Of note, these qualities also increased at time-point 2 and maintained slightly higher levels of shared mission congruence, trust, value, and involvement. This is important to note because these findings suggest that some elements of the CAP were sustained throughout the pandemic, although less members completed the assessment at the second time-point. Relatedly, this ties in with the underlying strength in weak ties in the context of a pandemic. In discussion with interview participants, qualitative findings confirmed how the quality relationships between CAP members greatly facilitated the collaboration process and would have proven difficult otherwise.

Perceptions of value and trust are considered core dimensions of connectivity that can have significant implications for successful collaborations (Varda et al., 2008a; Varda & Retrum, 2012; Varda et al., 2012). Trust can also be a key factor that can lead to more meaningful relationships between partners during stressful times (Stewart et al., 2009). Given this, some studies have urged researchers to consider levels of value and trust shared among collaborating agencies, as well as any changes in levels observed over time (Provan et al., 2005; Varda & Retrum, 2012). Of note, quantitative results demonstrated high levels of trust already embedded within the network at time-point 1, which may explain the levels of trust and value maintained throughout the pandemic. It's also possible that having high levels of trust prior to the pandemic had the ability to strengthen weak ties within the network. These details can be used to identify areas that can be strengthened or prioritized for dissemination of resources, services, or other products. Findings illustrated in sociometrics showed whether there were any relationships between the relative value and trust of agencies in the network with reported levels of collaboration. This can guide strategic decisions for improved collaborations by highlighting the most valuable agencies in the network along with their role in sustaining collaborative relationships.

Furthermore, literature suggests that high congruence of values can act as a proxy for having a history of collaborations or relationships (Honeycutt & Strong, 2012). The findings from the current study are consistent with these assertions. In this case, the network demonstrated 80% of shared value, and partner characteristics collected from qualitative interviews revealed that partners had a prior history of collaboration or relationship with other CAP members or with Flint community agencies more broadly. Future studies are encouraged to examine factors related to prior history, shared values and frequencies of communication on

collaboration outcomes, as well as community impact more broadly. Overall, these details regarding the whole network structure, as well as node level positions, imparted "complex power structures" inherent in collaborative relationships (Varda et al., 2012). These findings extend beyond SNA metrics with the integration of resources, trust, and value to understand the overall CAP network while also attending to the influence of relationship qualities. Getting an overview on the overall network structure and insight into partnership dynamics can guide more strategic decisions about collaboration, such as which key stakeholders to engage with and retain within the collaboration over time (Provan et al., 2005, 2009; Varda et al., 2012).

RQ3. How Did Perceived Success from Timepoint 1 Differ from Timepoint 2?

Overall, partners viewed the CAP as successful across time-points in the network survey. No significant differences were found in the distribution of survey responses between time-point 1 and time-point 2. Of note, some partners indicated a great need to improve the partnership and overall collaboration efforts in the Flint community throughout the interviews. As one partner expressed, "*We're just not there yet*." Others had expressed concerns regarding the loss of "casualties" to shift the CAP in response to the pandemic when discussing hindering factors. These findings are consistent with some literature on community collaborations in public health indicating that successful outcomes are not well assured because cooperative relationships are proven difficult (Varda et al., 2012). This can also be interpreted as partners viewing the CAP's *process* as successful but needing additional work to get to their prioritized goal of working together toward health equity efforts in the community.

Intermediate CAP goals were examined using perceptions of success. Perceptions of success in meeting goals are considered important indicators of the network's overall effectiveness (Garland & Brookman-Frazee, 2015; Litt et al., 2015). The literature on partnership

success is varied, with studies defining partnership success broadly and inconsistently across fields. However, some literature has pointed to essential elements needed to be in place for a partnership to be successful. For instance, theories posit how partnership success can be modelled by (1) conditions, (2) commitment, (3) contributions, and (4) competence, where conditions and competence are essential for successful coalition building (Mizrahi & Rosenthal, 2001). Other theories posit that success is achieved by proxy of "results from permanent connections between sectors with lasting impact upon equity and population health" (Riley et al., 2020, p. 4). The current project explored CAP success using two general indicators: (1) factors of collaborative functioning (i.e., facilitators, barriers, motivations) and (2) perceived success using ratings from the PARTNER Tool as well as discussions grounded primarily on the perspectives of community partners in the CAP (Zakocs & Edwards, 2006).

Goal Congruence

Additionally, because goal congruence has been associated with perceptions of success (Ansell & Gash, 2007; Lasker et al., 2001; Provan & Kenis, 2007), the project also examined partners' perception of goals, as well as their perception of the most prioritized CAP goals. Overall, all partners primarily perceived the reduction of health disparities as the primary CAP goal. This goal is consistent with the overarching aims of the CAP that were written into the funding grant. Consensus among these responses were also examined using procedures from prior literature (Chapman & Varda, 2017; Litt et al., 2015; Retrum et al., 2013). Scores of goal congruence revealed medium levels of agreement on at time-point 1 but lower levels of agreement at time-point 2. These findings may be a reflection of the fluctuating environmental impacts from COVID-19 on the partnership's infrastructure and shift in priorities. For instance, this shift may have caused a lack of clarity regarding the CAP's direction or purpose. By

triangulating these responses with qualitative findings, interpretations of lower goal congruence was explained by CAP leaders and partners discussions about the CAP's adjustments to meet different priorities, while also finding innovative ways to address health inequities in the context of COVID-19.

Other factors may also impact the extent of goal congruence. Some existing case studies of partnerships have demonstrated how success is determined by the extent a partnership meets the specific aims of partners. Noted in these case studies is how some aims may be shared, such as ideological missions related to reduction of health disparities, while other aims might be specific to a partner, such as publications or grants (Palinkas et al., n.d.). This might account for variations of goals as informed by one's role or other partner characteristics. Other studies have also challenged the assumption regarding goal congruence and success, suggesting that goal diversity is important for successful collaborations, particularly for the innovation of ideas (Litt et al., 2015; Vangen & Huxham, 2012). This aligns with some theoretical assumptions in the network field, where diversity of resources or ideas can facilitate innovation (Wasserman & Faust, 1994). While goal congruence serves its practical purpose in collaborating toward a common goal and minimizing conflicts; goals are still dynamic by nature and can fluctuate alongside any changes made to the CAP overall (Vangen & Huxham, 2012). Future studies are encouraged to further examine the distinctions between goal congruence and goal diversity to determine whether affiliated outcomes lead to any variations in perception of success.

How do SNA Measures and Organizational Characteristics ("Trust" and "Value") Relate to Partners' Perception of CAP Success at T1 and at T2?

To address this question, the project utilized exploratory correlational analysis with Spearman's Rho to examine any relationships between perceived success, trust, value, and SNA

measures (e.g., degree, betweenness, closeness, degree centrality, in degree and out degree centrality). Findings did not indicate any significant correlations between trust, value and perceived success. However, other relationships between trust and value scores were found. For instance, a partner's role as an academic or community partner influenced their level of trust and value, as well as collaborators that you seek out (out-degree) in a partnership. At time-point 1, having a higher number of partners (degree) or having higher numbers of partners who endorsed them as a collaborator (in-degree centrality) correlated with higher value scores. Having higher qualities of bridgers (betweenness) was related to higher value scores. These relationships seem logical, as data showed patterns that recognized the value of partners who were critical to the network's connectivity. As discussed, literature supports how overall value and trust of a network can have significant implications for successful collaborations, including the role of influential, key partners (Varda et al., 2008a; Varda & Retrum, 2012).

At time-point 2, these findings changed and were not aligned with relationships that were found previously at time-point 1. This was likely due to the smaller sample of responses. Nonetheless, findings showed that having a higher number of partners (degree) had a positive influence on perceived success and power/influence scores. Thus, those who had reported more collaborators tended to see the CAP as more successful than those with a lower number of reported collaborators. This is consistent with prior studies that have demonstrated how more densely connected networks tend to perceive themselves more successful (Provan et al., 2003) because they create a normative environment for collaboration. Given the smaller sample size at time-point 2, interpretation of findings is difficult. These findings might also be impacted by perception of goals. For instance, if a partner believes having a lot of relationships was the overall goal of the CAP, then perhaps they may see that particular goal as accomplished, given

their degree scores. If, however, a partner viewed the CAP's goal as more ideological (e.g., health equity), then perhaps they may see this goal as less successful and more challenging. Future studies are encouraged to further examine perception of goals and its relationship to perceived success with attention to how variations of these qualities (e.g., ideological or pragmatic) may lead to different responses or experiences.

RQ4. What are the Partners' Motivating Factors to Engage with the CAP at T1 and T2?

Motivating factors of community and academic partners were identified using survey data and qualitative interviews to understand what factors motivated partners to initiate engagement with the CAP as well as what factors sustained their motivation over time and why. Quantitative results identified the idea of collaborating with other agencies that shared their organization's philosophy and the opportunity to network with other community providers as the most frequently endorsed motivating factors across both time-points. These findings highlight shared perceptions among community and academic partners with a desire to engage in collaborative research and practice. Closer inspection of quantitative scores by partner type (e.g., community, academic) indicated that academic partners tended to report more motivating factors than community partners (on average). Although these average rates may have been impacted by the sample, this finding suggests that academic partners might have more to gain in their participation with the CAP than community partners. Future research is encouraged to explore this direction to determine whether there are differences in perceived gains among partner types and how that may influence motivating factors to participate.

With triangulation of qualitative data, motivating factors by partner type were explored in more detail. In addition to the most frequently endorsed motivating factors, community partners also reported factors related to the need for partnership synergy (e.g., "participating with the

CAP adds richness to my work with the PC members bringing expertise, perspective and wisdom that I lack") and a personal desire to advance and promote health equity work in the community. Community partners expanded on these responses, providing more insight into why these factors had motivated them to join. Overall, findings indicated that community partners recognized the need for collective action to overcome challenges in their community and the need for developing processes that could sustain long-term outcomes in Flint. Community partners also expounded on having a personal mission to contribute to the community, sharing their "*historical perspectives*" to inform future health equity leaders, and other perceived gains that could be obtained from their involvement. These findings highlight different levels of motivating factors related to the individual as well as to the broader community. These findings add to the literature documenting how community partners can benefit from CAP participation, as well as initial motivations to join a CAP.

Furthermore, academic partners primarily discussed motivations related to having shared missions with the CAP, potential mutual benefits in applying their prior research training in practice, gaining professional development, contributing to positive community outcomes, and having a sense of community. Of note, academic partners emphasized sense of community during qualitative interviews. For instance, one academic partner shared how this collaborative was "*something that I've always wanted to be a part of*" because of their prior community work. Another academic partner emphasized how the CAP allowed them to connect to others more informally for genuine relationship building, which helped facilitate their community-research and practice. These findings, while limited in scope, provide insight into what motivates academic partners to join and stay apart of CAPs, as well as what they perceive as potential advances to community-based research.

Taken together, these findings document and broaden understanding on community partner perceptions and motivations, enhancing the literature on community stakeholder participation. Some literature has indicated that motivating factors focusing the mission of public good rather than individual motivations can lead to improved collaboration outcomes (Varda et al., 2012). Other literature has also suggested that community partners are more motivated to participate if they believe that their engagement with the CAP would lead to concrete outcomes (Ansell & Gash, 2007). While ultimate outcomes and impact of the CAP remains uncertain, the findings presented here suggest that all partners held individual level motivations to promote the mission of public health equity (to some extent) and viewed their efforts as leading to concrete, sustainable outcomes in the broader Flint community.

How have Motivating Factors Changed Across Time-Points?

Changes in motivating factors were examined using both qualitative and quantitative data. Although the degree of motivating factors endorsed at time-point 2 were much higher than time-point 1, these changes were not found to be statistically significant. This may have been impacted by lower response rates found at time-point 2. Qualitative interviews asked partners what was needed to sustain their motivations to participate with the CAP, particularly in the context of a public health crises. Community partners highlighted motivating factors related to the alignment with the vision and mission of public health equity and developing systematic processes that maximized sustainability of outcomes with consideration of historically over-researched issues specific to the Flint community. Community partners described having a sense of determination to continue supporting their goals toward health equity: "*We've got to somehow get the energy in a community that's already exhausted to forge ahead with more energy*" (P006). Of note, one partner shared how they needed to prioritize their efforts in reducing their

workload, as well as reported a lower number of collaborative relationships over time, which might be explained by these changes in motivation.

In regard to sustaining motivation, literature on CAPs have indicated that mutual benefits between both community and academic partners is sufficient to incentivize collaboration; but these motivations should integrate some extent of intrinsic drive, such as values to sustain participation (Green et al., 2001). The findings presented here demonstrate a strong intrinsic commitment to the Flint community as well as a personal desire to see tangible health equity outcomes. Other studies have also indicated that the extent of value and mission congruence among partners can be influential in deciding whether members want to collaborate with a CAP (Honeycutt & Strong, 2012). Given the degree of high value and trust confirmed from the SNA, it's possible that partners continued to feel motivated because of the quality of relationships already embedded in the CAP network.

Project Contributions to Gaps in the Literature

As proposed in the dissertation revision addendum (Appendix X), the project aimed to address four major gaps in the CAP literature. First, there is limited understanding on the experiences and participation of community partners in public health related CAPs. Second, there is even less emphasis placed on partner motivations to join and perceptions of CAP success. Third, there is limited knowledge on relationship ties between partners in CAPs as well as their relation to overall partnership functioning. Fourth, the impacts from external factors in fluctuating environments have been understudied in the context of CAPs, with limited scope on public health crises (e.g., from COVID-19) faced in historically marginalized communities. Contributions to each of these gaps are discussed in more detail in the following sections.

First, the CAP literature on experiences of community stakeholders' participation in public health related collaborations is limited. There is even less documented on community partners' motivations to join as well as how their perception of collaboration success influences their engagement with the CAP. Extensive reviews on community engaged partnerships have indicated how individual level characteristics, such as perceptions and motivations, are largely absent in partnership research (Meza et al., 2016; Ortega et al., 2018; Ortiz et al., 2020). Majority of studies reporting on this also tend to focus on academic-initiated partnerships broadly or predominantly academic perspectives. The current dissertation project adds to this literature by providing insight into the experiences of community partners in a CAP, who identify as key leaders and other academic partners engaged in health equity efforts. The project adds to the field by synthesizing data on motivating factors grounded more predominantly on community perspectives at the formation stage of the CAP and then again at a later phase over a one-year period. Contributing an assessment of motivating factors over a one year period also adds to the literature on motivating factors that can sustain a CAP member's involvement over time generally, as well as throughout a pandemic (Kamuya et al., 2013; Walsh et al., 2014). Additionally, qualitative interviews at time-point 2 expanded on these findings by further exploring why the endorsed motivational factors were particularly important to partners and how they facilitated or hindered the CAP's success. The project contributed findings on potential gains of CAP participation grounded primarily on the perspective of community partners. This captured a broader understanding about how partners were perceiving the collaboration process overall, provided insight into underlying partnership dynamics and where perspectives were shared with or distinct from academic partner perspectives. Such findings can inform more responsive and relevant strategies to sustain partnerships over time.

Understanding how community partners perceive the CAP process is important to consider for reconciliation of conflicts (Green et al., 2001). Yet, few CAP studies have emphasized community partner perspectives or considered its impact on the formation of the partnership over time. The study highlighted how facilitating and hindering factors to a CAP can evolve in response to its surrounding contexts as well as how such context can impact its ongoing development over time. For instance, the backdrop of the pandemic in tandem with racial violence and injustices had generated more support for the collaboration among public health leaders, which ultimately facilitated the collaboration process in carrying out equity work. Another example can be demonstrated in how CBO partners described these circumstances as facilitating shared missions to address health equity, particularly during a time when disparities and racial inequities in health care access were made more apparent to dominant groups. Documenting the process, including facilitators and barriers, to developing CAPs with CBOs can inform implementation science and practice by identifying approaches to facilitate partnerships to ultimately improve the research to practice gap (Ortiz et al., 2020).

Second, the project contributes to gaps in literature connecting knowledge on relationship ties in CAPs to overall partnership functioning. Partnership structure is not examined typically in CAP studies and heavily rely on qualitative descriptions (Drahota et al., 2016; Ortiz et al., 2020). However, a vital component to CAP processes relates to the network ties exchanged between partners, as well as the positions and locations of partners in an overall network. Grounded on the literature review in Chapter 1, there are existing gaps in knowledge and understanding of the interactive relationships exchanged between community and academic partners, as well as among community partners alone involved with CAPs (Behringer et al., 2018; Ortega et al., 2018). Additionally, examining CAPs using SNA metrics is underutilized with few studies

applying SNA to assess how social networks may influence partnership outcomes (Bright et al., 2017, 2019; Franco et al., 2015; Ortiz et al., 2020). The project contributed a network perspective to CAPs in public health by exploring visual patterns in ties varied by their level of collaboration and frequency of communication as well as locational properties of individual partners (e.g., betweenness, centrality, etc.) to better understand how power is distributed, quality of collaborative relationships, and potential areas in the network that can catalyze the partnership. A longitudinal assessment, while impacted by the COVID-19 backdrop, examined changes in these relationships with qualitative interviews contextualizing how these changes in the CAP's network structure could be related to facilitators, barriers, motivations, or other contexts embedded in and around the CAP that may impact its functioning. SNA results integrated with qualitative findings broadly captured the interplay of contexts from individuals, organizations, communities, as well as their interactive social systems (Luke, 2005; Provan & Milward, 1995; Provan et al., 2005). Building on the network literature allowed for an integrated discussion on the implications of legitimacy, trust, and strength of ties in community collaborations. Thus, findings from the current dissertation project contribute a broader understanding on how CAPs mobilize and collaborate to improve the ties among community members representing major public health departments, particularly when faced with a public health crisis.

Another important contribution of the study highlights the power of trusting relationships generated through a CAP as well as its community. There is extensive literature that purports better networked communities will more effectively increase their capacity to serve community needs and health (Paarlberg & Varda, 2009). However, the same can also hold true for communities that are not as well-networked but strongly share similar values, mission, and levels

of trust. Traditional network literature asserts that strong ties are maintained through frequent and emotionally intense forms of communication that allows for partners to establish a sense of comfort with one another over some time. However, other network literature has highlighted the strength in weak ties, which are maintained through less frequent and less emotionally intense communication. Both strong and weak ties carry important implications for resource distribution and promoting access. For instance, in terms of social capital, one study found that strong ties with core actors can make it easier to get resources than weak ties (Li et al., 2008). Alternatively, other studies focused on relationships mobilizing for social action have emphasized the influence and power of strong and weak ties based on trust. Some network theorists refer to these ties as "philos" in relationships that can magnify the strength in weak ties (Krackhardt, 2003). With philos, attention is paid to the affective qualities of relationships, such as the presence or absence of interactions, affection and a prior history of interactions (Krackhardt, 2003). Here, the embodiment of trust is reified through interactions that create opportunities, affection that creates motivation to treat one another positively, and time that creates the experiences to gain familiarity or awareness. The theory of philos aligns with the Flint case study exampled here. All partners in the CAP shared prior experiences with at least one other CAP member and nearly all had a prior history of working with Flint community agencies more broadly. Network data indicated high levels of shared mission, trust and value with other partnering organizations in the CAP. The SNA results showed their interactions with one another at multiple time-points, suggesting that there were existing opportunities to work together to some extent, regardless of whether the CAP had coordinated it. While affection for one another cannot be confirmed, qualitative findings indicated that there was a stated affection for the city of Flint (e.g., "*This is my city*"). All these components arguably support for the strength of weak ties in the context of

philos, which have greater potential to change systems for health equity, enhance power, minimize resistance to change among affiliated partners, and provide support and comfort throughout the process (Krackhardt, 2003). Krackhardt (2003) has asserted, "Change is the product of strong affective and time-honored relationships" (p. 238). Future studies are encouraged to explore how philos in CAPs can facilitate social action toward public health equity, in particular, as well as how a *shared* sense of community influences partnership functioning.

Finally, the project also contributes to existing gaps on the external influences from fluctuating environments on CAPs. While COVID-19 itself was an unprecedented crisis, the impact from health inequities in underserved communities as well as racial violence among communities of color has been historical and ongoing prior to the pandemic. Regardless, there is limited scope on how these layers intersect with public health crises related to COVID-19 or how these factors can influence the formation and partnership functioning of CAPs. There is even less research examining specific motivations or mechanisms for strengthening partnerships during these periods of environmental fluctuations (Ahuja et al., 2012; Bunger, Doogan, et al., 2014). However, there is strong evidence that asserts how partnership effectiveness can be influenced by factors in external fluctuating environments (Ahuja et al., 2012; Bunger, Doogan et al., 2014; Butterfoss et al., 1996; Lasker et al., 2001). The dissertation project was able to uniquely explore how the CAP continued to function in and respond to external factors from fluctuating environments to support their community partners and members in Flint. Moreover, deliberate decisions made to alter a network in response to the environment, can have consequences in the future (Ahuja et al., 2012). Findings documented how this CAP functioned in response to a health equity crisis prioritizing opportunities to support and build relationships. Prior research

has understudied the components of CAPs or other partnerships that have made them successful in the face of emergencies. Overall, this project expands the line of research on external factors that may constrain or strengthen partnership networks in the context of public health crises. While the literature is limited, maintaining flexibility to respond to unanticipated needs, as well as resource-constraints, is crucial for the survival of partnership efforts (Acosta et al., 2015). For example, CAP core leaders (of the current study) incorporated responsiveness and flexibility in their approach to try to understand what their community partners needed first before acting to change any CAP activities. This study also extends beyond geographical and organizational constraints and contributes knowledge on how factors related to a public health pandemic influenced partnership dynamics throughout its onset. That is, qualitative findings attended to the impacts from community contexts, including barriers related to external influences such as history of working in silos in the Flint community, political backdrops from racial injustices, distrust, challenges in navigating other cultures embedded in organizations or in community-based settings, and facing the end of the CAP's grant funding mechanism. Findings also identified strategies and strengths in maintaining the partnership during a period of great environmental fluctuation joined with the harmful political backdrop, unjust murders of minoritized community members, trials for the water crisis, as well as fighting for access to verifiable information on COVID-19.

Overall, the dissertation project sheds light on various aspects of partnership functioning, with focus placed on motivations, facilitators and barriers to collaboration, network structure, and external environments. In identifying and exploring determinants to collaboration efforts, the project also contributes literature on what partners perceive as influential to CAP success. Taken together, these contributions can inform potential ways to better design strategies for community

partner engagement, inclusion, and maintaining CAPs during a period of great environmental fluctuations.

Limitations

The dissertation project has a number of limitations. First, the study is limited by its sample size. The sample selected for the surveys and interviews is smaller than 30, which can increase the likelihood of Type II error rates and respondent biases (McNeish, 2017). However, the network analysis was focused on exploring existing relationships between partners. The qualitative sample was purposive, identifying key stakeholders who were most knowledgeable about the CAP's efforts. This was expected to provide the most reliable perspectives regarding partnership collaboration. Of note, the qualitative subsample of nine is considered appropriate if data saturation has been reached and if no new codes are emerged. Using consensus procedures, data saturation had been reached during interviews, as well as during the data analysis phase. Furthermore, seminal literature points to recommendations for qualitative sample sizes ranging from 3-10 (Creswell & Poth, 2017), no more than six (Morse, 2000), or determining sample sizes by the extent of data saturation (Glaser & Strauss, 2019; Guest et al., 2006) or information power (Malterud et al., 2016). Thus, the qualitative subsample of nine from the 25 participants was appropriate to capture the depth of CAP experiences. Nonetheless, the sample size places limits on the extent of generalizability of findings.

Another limitation relates to the network metrics. The study may have been limited by the selection of network metrics for the current study. To date, there are many more extensive measures that can capture a network's composition to test structure, positions or hypotheses (see Wasserman & Faust, 1994). However, for the purpose of this exploratory project, focus was placed on well-known measures that captured basic structure and locational properties at the

whole network and node level (e.g., partner) to obtain an overview of what the network looked like, as well as what types of interactions were occurring over the span of a year. The measures calculated from the PARTNER Tool were validated using community-based participatory approaches and were considered the most important and relevant metrics to examine in the context of public health networks (Varda et al., 2008a, 2008b; Varda & Sprong, 2020). These basic measures are expected to guide collaborations in practice, as well as highlight community partners' perceptions throughout the process. Accordingly, these metrics were selected on their basis of practice to guide decision-making for partnership efforts for community practitioners. Other studies can build on findings from the current project to examine or test assumptions based on what was shared from qualitative interviews. For instance, testing whether having more gains predicts higher level of collaboration using Exponential Random Graph Models (ERGM) may be a possible contribution in the future. While visual representation of the CAP network allows one to visually examine patterns of relationships over the year, caution should be taken in interpretating sociograms and inspected more closely with the elaborations provided during the interviews.

Relatedly, another potential limitation attends to the psychometric properties of instruments used in this study. Psychometric properties of network instruments are limited (Brown et al., 2014); however, there is evidence to support that self-reports of interorganizational collaboration are indeed accurate and reliable (Calloway et al., 1993). Some have also purported how the relationships between organizations may be a better account for behaviors among actors within a network (Mizruchi & Marquis, 2006). Instruments used to collect motivating factors (DPQ), as well as facilitating and hindering factors, were grounded on findings from a prior systematic review on CAPs, ensuring a measure that was evidence informed. However, given the

sample size below 30, literature advises not to carry out reliability of instruments (Samuels, 2015). Alternatively, integration of quantitative data with qualitative findings was expected to clarify and expound on meaning and perspectives of responses, which can be a possible indicator for the reliability of measures (Gibbert et al., 2008). In applying this methodology, there was a great opportunity to elicit rich and illustrative data on experiences of community partners, in particular, adding insight to the literature. Moreover, approaches to examining CAP network structures and processes have been largely qualitative, with limited number of studies integrating mixed methods with qualitative interviews and SNA (Drahota et al., 2016; Ortiz et al., 2020). Therefore, the study approach also adds to the methodological approaches examining case studies of CAPs in public health. Nonetheless, future studies are encouraged to examine and test the psychometric properties of instruments used here with a larger sample.

Another limitation relates to missing data in the network phase of this project. Missing data for whole network studies is common, and the literature guiding best practices is varied. Some studies recommend a threshold of 50% to 75% response rates (Grosser et al., 2010; Kossinets, 2006; Wasserman & Faust, 1994) to minimize negative impacts from missingness. Depending on the metrics and analyses used, other studies have identified a 20% response rate as acceptable specifically because in-degree and out-degree centrality are less sensitive to missing data and recommended to use with "less than complete data" (Borgatti et al., 2006; Valente et al., 2008). However, Neal and Neal (2017) caution that because the unit of analysis in SNA is the relationship and not the individual, "small amounts of missing data have the potential to dramatically change conclusions" (p. 289). Furthermore, the impacts of missing data on network structure may be different depending on the proportion and patterns of missingness (Adams, 2020). Missing data can also restrict the interpretation and generalizability of findings to the

broader population (Huebner et al., 2018). However, the response rate at time-point 1 was considerably high (> 80%), while the response rate at time-point 2 was much lower. It's possible that the responses from the first assessment may have implications for reliability of indicators used to determine collaborations at time-point 2. To overcome missingness in the network data, ties were imputed if a relationship was endorsed by one partner in the network, which has been found useful in examining smaller sample sizes (Bright et al., 2019; Brown et al., 2014; Petrescu-Prahova et al., 2015; Schoen et al., 2014). The project also provided results from a directed and undirected network to provide a comprehensive overview on whether collaboration was occurring and what ties were embedded in the network. Less emphasis was placed on the directionality of relationships (e.g., receive/initiate) in this project. Thus, impacts from imputing undirected ties was considered minimal given the alignment with the overall research design. Excluding non-respondents on the basis of the relationship's direction (if not relevant to the study design) can introduce the possibility of response bias (Honeycutt & Strong, 2012). Furthermore, because the SNA was only exploratory, the impacts from missingness are not as problematic as causations were not being tested from the network structure.

Additionally, interpretation of SNA results and qualitative findings should be read with caution. In the case of SNA, details collected on the network structure only tell half the story rather than fully explain the effectiveness of the CAP. Furthermore, because network ties were imputed with undirected ties, it's possible that the structure may have been distorted or overlooked important ties that might explain the patterns of collaboration (Kenis & Knoke, 2002). Cross sectional analysis of networks are also limited in determining causality (Ahuja et al., 2012; Brass et al., 2004) and cannot ensure endogeneity regarding relationship measures (e.g., underlying factors that were not measured). It also cannot be assured that capacity building

was implied simply through the presence of ties (Provan et al., 2005). Furthermore, a tie that demonstrated a high level of collaboration activity may not have been considered strong in terms of trust or value. However, the study attempted to capture different layers to the collaboration experience in order to corroborate the phenomenon, emphasizing the perspectives of community partners. For instance, prior studies on CAPs have strongly encouraged the documentation of multiple time-points using network data, when possible. The current project attempted to collect network data at two time-points over a one-year period. This data illustrated how the CAP potentially changed, whether any progress was made in building partnerships or in meeting overarching goals, as well as how extenuating environments shifted its efforts. Such details are important for understanding existing partnership efforts (e.g., changes in activities) in order to successfully sustain a network over time.

Another limitation relates to external validity. Case study research is often criticized for lacking scientific rigor and generalization (Crowe et al., 2011; Gibbert et al., 2008; Yin, 1999). However, several strategies were utilized to address these concerns and enhance the reliability and validity of data collection sources and findings to ensure the trustworthiness of data. First, given the contextual differences in collaborative experiences, pattern matching, and theory triangulation was used to ensure the internal validity of findings by comparing observed relationships from this study with patterns existing in prior literature across various contexts of CAPs involved in health efforts. Theory triangulation necessitates the integration of multiple perspectives for more trustworthy findings (Gibbert et al., 2008). Given the nature of the project as a mixed methods design, the integration of both quantitative and qualitative approaches enhanced the trustworthiness of the data, triangulating data to better understand both the depth and breadth of CAPs. Second, the project utilized strategies that have demonstrated evidence to

enhance construct validity (e.g., the extent a conceptualization or operationalization of a concept is actually measured) for case studies, in particular (Bernard, 2006; Gibbert et al., 2008; Gibbert & Ruigrok, 2010). These included: (a) establishing a clear chain of evidence and (b) triangulating data sources. To establish a clear chain of evidence, explanation of findings and their implications were guided by the existing literature on CAPs, collaboration research, and network theory. In applying a mixed methods design, data was collected from multiple data sources, including quantitative surveys, qualitative interviews, observations, meeting memos, research memos from coding procedures, and ongoing meetings with the academic co-PI. These efforts were expected to enhance the construct validity of data collected from CAP partners. Furthermore, transparency of all procedures was maintained to establish rigor for the study's design (Crowe et al., 2011; Darke et al., 1998; Gibbert et al., 2008). Of note, external contexts related to COVID-19, as well as other racial injustices, may have greatly threatened generalizability to other CAPs. That is, generalizing these findings to any CAP is limited, as the current study carried out data collection during very extenuating circumstances of a global public health crisis and racist pandemic. Regardless, findings offer important contributions to the literature on CAPs functioning within the backdrop of fluctuating environments, as well as provide insight into the potential of collaborations in sustaining health equity efforts.

Other issues surrounding these limitations related to power dynamics from the researcher, collaborations, and agency affiliation. First, it is possible that social desirability biases were presented in survey responses and interview discussions. Given that the researcher had an established relationship with many of the CAP members, it is possible that participants provided more favorable responses to be socially acceptable either to the interviewer, employer, or broader research center. Thus, some details may have been missed. Second, partnershipts

between community and academic agencies tend to navigate difficult power dynamics regarding who holds knowledge, expertise, and decision-making power (Andress et al., 2020; Coombe et al., 2020). In this project, some partners described themselves as "outside layers" whereas others emphasized partnership synergy ("whole is greater than its parts"). This may be an indication of power dynamics in the CAP and inconsistencies in partnerships perspectives. While not a direct limitation to the project, readers should caution when interpreting findings and consider how power dynamics may have impacted suggestions, experiences, or endorsement of responses. Notwithstanding these limitations, the findings reported here can still direct future research, as well as offer insights to design strategies that can strengthen relationships with community and academic partnering organizations.

Implications for Future Research

Future research is encouraged to examine other models for collaborations, as well as different types of collaborative efforts. The current study applied the adapted Model of Research Community Partnership (MRCP) to examine partnership formation and functioning. While this is a well-known model typically applied for CAPs, there are several other frameworks that can guide study designs in understanding partnership development, such as the Community Coalition Action Theory (Butterfoss et al., 1996; Zakocs & Edwards, 2006). Furthermore, CAPs are only one type of collaborative effort located in the broader context of community collaborations that may not fully integrate CBPR principles when implemented into practice (Drahota et al., 2016; Frank et al., 2015). Future studies are encouraged to compare models of collaboration with attention to power infrastructures that may be more beneficial for community partners over others that are burdensome and unproductive for full engagement in the partnership.

Additionally, there is a need to build stronger empirical support demonstrating how collaborations lead to positive individual- and community-level impact. The existing literature on direct community and population level improvements from collaborations has been mixed, given the challenges in testing collaborative models (Nowell & Foster-Fishman, 2011; Varda & Sprong, 2020). Some studies have posited collaboratives (broadly speaking) are indeed effective interventions that can strengthen organizational capacity, which in turn, leads to greater community resilience or community carrying capacity (Nowell & Foster-Fishman, 2011; Varda & Sprong, 2020). Other studies claim that collaborative efforts serve great potential in impacting communities, but these implications are better supported in theory than in practice (Butterfoss et al., 1996; Lasker et al., 2003; Nowell & Foster-Fishman, 2011; Roussos & Fawcett, 2000). Future studies are encouraged to examine impacts of collaborative public health CAP efforts on individual and community level outcomes.

There is a need for more empirical studies to determine what conditions are needed to facilitate capabilities for engagement among researchers and practitioners in application (Butterfoss et al., 1996; Nyström et al., 2018). One direction for future studies extends to the role of partner characteristics. For instance, studies can examine whether having a *shared* sense of community or sense of belonging, is a condition needed in partnerships to facilitate collaboration outcomes. Of note, all nine partners who participated in the interviews for the current study had a prior relationship with someone from the CAP through their community work in Flint or some involvement with the Flint community before engaging with the CAP. Some participants even expressed Flint as "my city" to communicate ownership and emphasize the direct impacts on their own sense of home. Other partner characteristics, such as level of familiarity with other partners may also be a condition worth exploring. For instance, several partners shared how they

had known one of the CAP leaders for years, which motivated their engagement with the CAP because of the CAP leader's historical impact in public health. There is literature that supports how having a relationship for a longer time with a partner can influence the likelihood of sharing power to achieve goals as well as positive social change impacts (Mizrahi & Rosenthal, 2001). Thus, future studies are encouraged to consider how partner characteristics, such as shared sense of community, sense of belonging, and longevity of relationships with other partners can facilitate partnership outcomes and increase their usefulness in practice (Nyström et al., 2018).

Another direction in this regard extends to the influence of partner roles. The current study found that community partners tended to report more hindering factors than academic partners, suggesting that they may have perceived the collaboration as more challenging or had perceived more losses than gains. It's possible that community partners may have more to lose and thus take note of more challenges because of their deeper connections to their community than academics who tend to commit to the hierarchical structure and demands of their institution. The roles of leaders can also influence partnership outcomes. For instance, effective leadership can influence how other CAP members perceive the overall success of meeting goals, as well as their satisfaction with the collaboration effort (Butterfoss et al., 1996; Mizrahi & Rosenthal, 2001). Future studies are encouraged to more closely examine how roles (e.g., community, academic, or leader roles) may influence partnership outcomes, as well as shape perception of success.

The quality of interactions requires more in-depth exploration. For instance, there is empirical support that higher mission congruence between partnering organizations in a CAP is a significant predictor of network contributions and partnership outcomes (Chapman & Varda, 2017; Nowell, 2009). The current study found over 80% of mission congruence among partners

with moderate levels of network contributions (e.g., resources dedicated to the CAP). Future studies are encouraged to examine the relationship more closely between mission congruence and resource sharing to determine whether mission alignment motivates partners to contribute more to the CAP overall. Other examples extend to frequency of relationships, levels of trust, and responsiveness to community needs. Broadening understanding on the quality of interactions may guide CAPs to ensure more effective outcomes (Nowell, 2009).

More research on processes shaping community engaged partnership dynamics is needed (Ortiz et al., 2020). For instance, how CAPs are initiated can greatly influence their process and development (Drahota et al., 2016; Garland & Brookman-Frazee, 2015). The case study example used in this study was primarily a research-initiated CAP. Research-initiated CAPs are much more common than community-initiated collaborations (Lesser & Oscós-Sánchez, 2007). Thus, these findings may look differently if the effort was initiated by community members. Another example extends to external contexts embedded in this initiation process. For instance, research specific to CAPs have indicated barriers related to tensions in competing interests and balancing community needs with research (Lantz et al., 2001; Lindamer et al., 2008). In other words, academic partners or institutions may need to fulfill certain grant requirements or deadlines that may compromise prioritization of community needs. Future research is encouraged to examine how varied forms of initiation can lead to different outcomes as well as how these structures shape processes in power and equity among partners. Another direction for research can incorporate community context from an international perspective. The current study only captured community and other environmental contexts specific to the U.S. However, health inequities are global issues. Future studies are encouraged to consider examining and comparing the developmental process of CAPs (or other forms of collaboratives) in international settings,

extending beyond the U.S., to explore potential strategies or models that are integrating needs and responses more efficiently.

Furthermore, sustainability may not always be the goal of a partnership or an indicator of a successful partnership. Some partnerships have very narrow or short-term objectives, while others seek to build long-term relationships. Other partnerships may alternate between objectives to stay responsive or to navigate environmental circumstances. Future studies are encouraged to redefine sustainability of CAPs in community practice by emphasizing the gains of individual partners and their organizational affiliations. For instance, while outside the scope of the project, many partners who were interviewed felt that they had gained some personal or organizational accomplishment, ranging from a new data system that improved organizational processes to understanding what the word "community" meant in practice. Future studies are encouraged to examine sustainability of CAPs in terms of various levels of personal, organizational, or community gains as perceived by the partners participating in the CAP rather than a research objective as these processes are just as meaningful and lay the groundwork for future collaborations.

The current study did not examine power differentials specifically but found qualitative data to support the presence of differentials in power dynamics and decision-making. Of note, community partners in community-engaged partnerships rarely share equal power, status, and decision-making with academic partners (Lesser & Oscós-Sánchez, 2007). However, action research and community practice, particularly for public health equity efforts, would benefit from greater involvement of community partners from the onset of the project (including initiation). Future studies are encouraged to further examine how power dynamics in the context of CAPs with historically marginalized communities shape collaboration outcomes. While the

study identified some of these issues as barriers, it's significantly important to measure power specifically among community partners to determine ideal conditions needed for CAPs to succeed.

Policymakers, as well as other governmental agency leaders, are needed in CAP collaborations for broader impacts and sustainability of partnership outcomes (Lasker et al., 2003). Unfortunately, this study was unable to successfully recruit policymakers or explore their collaboration experiences with the CAP. Challenges in engaging with policymakers were also discussed in some of the qualitative interviews, where participants shared difficulty in accessing state level data to guide their dissemination efforts. This indicates the need for more research on strategies to better engage and include policymakers in CAPs and in maintaining their engagement over time. Studies on CAP networks with community, academic partners, and policymakers are also limited. Because diverse stakeholders, including policymakers, are so critical for facilitating buy-in and sharing knowledge regarding health equity practices (Norris et al., 2017), future research is encouraged to focus solely on what factors facilitate policymakers' engagement, what challenges they face, as well as recommendations to meet their needs for inclusion in CAPs.

In terms of directions for future research applying SNA, future studies are encouraged to examine network dynamics explained by degree assortativity. For instance, the CAP network in the current study demonstrated disassortativity at both time-points. To reiterate, this indicates that agencies with a high number of collaborative relationships with other partners (high degree) tended to establish relationships with partners who were not as engaged (low degree). Network literature has indicated that disassortativity is driven by "complementarity needs," (Ahuja et al., 2012, p. 437) whereas assortativity (opposite) tends to be driven by homophily (e.g., birds of a

feather flock together). In context, this implies that the CAP's network patterns were driven by an organization's need for resources to meet goals or to succeed. Given the backdrop of the pandemic, these findings highlight the value and importance of organizational diversity in partnerships, particularly when organizations in a CAP are trying to "stay afloat." These findings extend directions for future research in community psychology that utilize community driven partnerships. Future studies are encouraged to examine the role of organizational diversity in CAP networks to underline the value of diverse resources in building CBO's capacity to succeed.

Additionally, the network boundary of the CAP was bounded within the context of the FCHES CAP for feasibility of the dissertation. Of note, partnership networks are fluid, and their development is constantly recreated (Ahuja et al., 2012; Soda et al., 2004). It's possible that the study may have missed outcomes generated from the CAP because of the network boundary specification. Future studies are encouraged to examine social ties outside the CAP using name generators (in addition to rosters) to broaden understanding on distal outcomes of the partnership that extend beyond the CAP infrastructure. Not collecting data on these social ties was a missed opportunity to examine collaboration outcomes with the broader community to inform sustainability and impact.

The question remains whether CAPs should be funded and whether these efforts ultimately improve capacity of communities to achieve goals. How can we return the investment on collaboration? By highlighting the potentials of collaborations, even in unsuccessful efforts, more light can be shed on what components were stronger over others and where efforts should be focused to improve and support partnerships long-term. One can make use of all theories on collaborations, but are never assured a successful partnership, particularly if carried out with community and in practice. It is strongly encouraged that future research prioritize understanding

how partnerships function distinctly and in context before testing theories as well as prioritize adaptations for more relevant and responsive approaches.

Contributions to the Field of Community Psychology

The guiding values and approaches to community psychology prioritize social justice, action-oriented research, globalization, multidisciplinary perspectives, public policy, empowerment, culture, community strengths, diversity, and promotion of well-being (SCRA, 2021). Aligned with these foundational values, the current dissertation project explored CAP processes that attempted to prioritize and highlight community assets building on partner perspectives. As a discipline, community psychology is uniquely oriented to examine partnership dynamics that merge traditional research with practice, making it fit as a catalyst for change. Community psychology has historically focused on individual behavior, contexts, and working directly with communities to improve community health, resources, or other forms of influence (Trickett, 2009). The ecological perspective emphasizes multiple levels of contexts and interrelationships between individuals and their social systems surrounding a social issue, shifting focus to the localized conditions for improvements (Trickett, 2009, 2019). The current dissertation project was shaped largely by community psychology perspectives based on ecological levels expanded to network-based research in the context of community academic collaborations. This overall design underlined community context and community participation in informing collaboration strategies for improved efforts.

As discussed, CAPs are viable approaches that can be implemented to promote public health equity and build or tailor practice-based interventions that can be sustained with community-based settings (enjoined with academic evidence) (Drahota et al., 2016; Griffith et al., 2010; Pellecchia et al., 2018; Smith et al., 2005). However, developing CAPs in over

researched settings and partnering with historically marginalized populations can present additional challenges to consider (Abdulrahim et al., 2010; Benoit et al., 2005; Brown et al., 2005). In this context, there is a need for more knowledge on best practices that can be used to develop and sustain CAPs ***with*** *historically marginalized communities* that can attend to power dynamics, shared values, trust, community voice, and social action. Findings from the current dissertation project identified factors that are evidenced to influence partnership dynamics and effectiveness, including facilitators, barriers, motivations, and partner gains (Coombe et al., 2020; Lasker et al., 2001). The study also highlighted the importance of shared values, trust, and history of relationships in maintaining collaboration efforts during extenuating environmental fluctuations. Such details can be used to inform or tailor efforts to CAPs within settings that reflect historical contexts of Flint. While Flint is a unique context, the literature has demonstrated how high levels of trust embedded in relationships can increase the impact of partnerships and facilitate the co-creation of community knowledge and assets across other settings (Noel et al., 2019). Identifying other factors that can promote the sustainability of CAPs is important to understand how to implement CAPs with long term success in its design (Nowell & Foster-Fishman, 2011).

The project also underlines the power of partnership synergy in strengthening relationships within the CAP throughout the public health pandemic. Partnership synergy is defined as the cross-pollinating process of knowledge, skills, and connections combined through diverse partners to achieve goals (Lasker et al., 2001; Weiss et al., 2002). In this case, partnership synergy was captured in the overall network structure detailing the extent of collaborative relationships across diverse partners and qualitative findings indicating how public health equity efforts are facilitated through qualities of interactions, among other factors.

Synergy is critical to understanding partnership effectiveness and sustainability of community-academic partnerships (Coombe et al., 2020). Findings add to the conditions needed for synergistic collaborations and the value in integrating different partner perspectives to develop strategies that can better achieve CAP goals and outcomes (Coombe et al., 2020; Jones & Barry, 2011; Trotter et al., 2015).

As community psychology (CP) emphasizes a social justice orientation and values-based praxis (Prilleltensky, 2001) for working with historically marginalized communities, it is the responsibility of the field to study and understand what went well, what did not go well, and what lessons can be generated from these partnership case examples. For instance, many partnerships in public health fail to thrive (Lasker et al., 2001; Trotter et al., 2008), but there is a social responsibility as community psychologists to understand why, prioritize community strengths therein, as well as identify opportunities for growth and improvement to continue supporting methods that can amplify community voice. Doing this also has important implications in shaping the narratives of historically marginalized communities that tend to have research focused on their failures framed as losses (or problematic) rather than opportunities. Taking a community psychology perspective with asset-based approaches, this project has highlighted strengths within various components of community partnering agencies, including their contributions, motivations, and interorganizational connections. There is also existing literature that views "failures" as indicators for resilience, particularly if the CAP has had to redirect its entire structure, such as the one demonstrated in this project (Ahuja et al., 2012; Mizrahi & Rosenthal, 2001; Nicolaidis et al., 2011). The case study exampled in this project should be viewed as a rich, detailed contribution of process, perspectives, and dynamics to guide future collaborations.

Furthermore, ecological perspectives grounded in community psychology acknowledge that social networks are one of the many contexts in which people function. Borgatti et al. (2009) write, "Individuals are embedded in thick webs of social relations and interactions" (p. 892). As such, networks become an important context to understanding collaborative efforts toward public health equity. The dissertation project demonstrated the importance of relationships in facilitating collaboration as well as shaping responses to public health crises. For instance, the CAP's infrastructure, while shifted, still attended to relationships, and relied on these relationships to inform next steps. These findings illustrate how social networks are deeply embedded in equity work and are particularly valuable when navigating issues in a historically marginalized community. From a network perspective, patterns of relationships as shown in the CAP network structure also have implications for creating opportunities or challenges that directly affect power dynamics and community participation. Findings highlight how position of partners by their network properties can be used to understand resource distribution, trust, and influential positions of power. These types of details can inform relationship building efforts and facilitate discussions about who holds power in the network and whether that distribution is equitable or reflects a community engaged process. Community psychologists are encouraged to merge ecological perspectives around public health equity with social networks and quality of those relationships in mind as they continue to approach partnerships to complement the field's praxis in context, community, and interventions. A more practical (less theoretical) contribution relates to the application of SNA in community-based research. Specifically, the project also aimed to demonstrate the accessibility of SNA as a practical application for community-academic partners. The project demonstrated how basic SNA measures can be used to learn about relationships embedded in CAPs that can implicate collaborative processes, power, and

influence. As mentioned in chapter 1, there is a limited understanding on how social networks can impact or influence partnership outcomes in CAPs (Behringer et al., 2018). However, this may be due to the fact that SNA is a complex methodological approach that can often require advanced expertise to implement, making practitioners reluctant to utilize it in practice (Brown et al., 2014; Varda & Sprong, 2020). The PARTNER Tool integrated with qualitative interviews, was able to capture contextual elements that can make meaning of connections embedded within a CAP's network structure while also broadening understanding on how community partner characteristics (e.g., motivations, perceived barriers or facilitators) can influence partnership dynamics. Future studies in community psychology can utilize SNA to better understand the structural and relational patterns within the ecological systems of academic institutions, CBOs, and their surrounding communities (Trickett, 2009, 2019). With values and approaches embedded in community psychology principles, this project also attempted to balance community practice with community science. For instance, while not explicitly discussed, early communication was maintained with the academic co-PI for any updates on the status of community partners as well as updates with the core leadership team about project changes and next steps. Some of the initial SNA findings were presented to the core leadership team using an infographic and demo on zoom to ensure transparency and facilitate discussions on interim findings that could potentially guide the CAP moving forward. A high-level overview of these updates was distributed to broader partners in a newsletter and website. This was believed to have fostered more genuine relationship-building that may have facilitated engagement with partners throughout the pandemic.

As a more personal contribution to the field, the researcher's training in community psychology prepared them to navigate the responsive changes of the CAP to COVID-19 as well

as the overall project. With values grounded on responsiveness, flexibility, and prioritizing community impact, the project continued to align with community psychology praxis in terms of acknowledging the historical systematic constraints that Flint community members would be facing in another crisis as well as tailoring strategies with consideration of such constraints. For example, when participants were non-responsive during time-point 1, the researcher would meet with CAP leaders to discuss what they had known about the state of their community partners, particularly because these partners were affiliated with agencies that would be key players in responding to community needs during COVID-19. The researcher began to review literature on ways to better engage community leaders and incorporated donations to these agencies, to demonstrate how researcher values aligned with those of community partners (with approval of changes from the MSU IRB). Other efforts were focused on relationship building with partners after receiving responses. That is, the research team (SS and TEB) followed up via phone and email with every partner that participated to demonstrate appreciation of how much their time was valued, as well as provide a useful incentive for their participation (i.e., VISA gift card). The team continued to make themselves available for any questions participants had regarding the project. The researcher also attempted to participate in many of the virtual events affiliated with the broader research center (FCHES) and their collaborators. Interactions in this context were limited but served the purpose to have the researcher continue community participation during a time when in-person meetings were restricted. This ensured some, but limited, extent of relationship-building and broadened the researcher's understanding of whose roles were changed and what activities partners were getting involved in (outside of the CAP). In doing this, the researcher recognized the value of bridging relationships to facilitate coordination and interviews, as well as aligning to values of the Flint community. Specifically, when participants

shared how many resources tended to leave Flint, the researcher made changes to the IRB plan to consider donations directly to community-based organizations localized in the Flint area. Community psychologists are encouraged to apply this demonstration to enhance their work on community collaboration and ensure transparent and intentional research initiation.

Overall, these contributions can inform future directions to the field of community psychology. As previously discussed, network-based strategies consider the ecological perspective of communities, organizations, power and distribution, and their interrelated connections that can directly influence partnership outcomes and ultimately public health equity in community-based settings. Such efforts adhere to the values and praxis reflected in the field with emphasis on community strengths and assets for social justice (SCRA, 2021). Findings from this work direct areas for improvement in developing partnerships with community-based settings and encourage broader applications of network-based approaches to understand the meaning of relationships, the qualities therein, and their influence to generate more sustainable and responsive CAP efforts.

Other Implications

The dissertation project also has practical implications for public health leaders, practitioners, and policymakers. As discussed throughout this document, partnerships are increasingly utilized as an approach to address the complexities of health equity related issues. Yet, many of these partnerships do not fully meet their objectives or carry out poor quality collaboration efforts (Roussos & Fawcett, 2000; Weiss et al., 2002). Findings from this project carry important implications to inform areas to focus on for improving partnerships toward health equity outcomes. For instance, when asked what was needed to maintain collaboration efforts, community partners expressed how it was necessary to center community needs and

perspectives, as well as build on existing relationships with attention to strategies that can foster trust where distrust may continue to be a larger issue. Putting community needs first has been found to be critical to successful public health equity CAP efforts (Carney & Hackett, 2008). These insights can be used to shape strategies to better approach partnerships with communities. Another insight was related to the multi-layer contexts embedded in partnerships. That is, some participants noted that one should approach communities as multiple systems rather than the idea of a unified unit (e.g., one "community" rather than enclaves of communities in community). Other multi-layered contexts relate to diverse stakeholder perspectives and experiences. That is, findings illustrate how community partners' experiences with CAPs are not necessarily uniform. There may be issues related to full participation and engagement as well as shared power in decision-making. This research broadens understanding on how different stakeholders may be motivated and interpretating outcomes or goals of the CAP distinctly as well as the extent to which these perspectives are shared. Such information can be used to guide collaborations by translating factors and insights into implementation strategies.

In identifying motivating factors, the project also provided insights into interpersonal factors that may be critical for partner engagement and participation. For instance, if practitioners are interested in maintaining consistent participation of stakeholders, it's important that all partners share some personal or interpersonal motivation as well as a solid understanding of what their role would entail. For a partnership to be successful, all partners must be willing to choose the role they play in the CAP with shared agreement to that decision (Palinkas et al., n.d.). Findings on hindering factors regarding inclusion of all partners (e.g., inconsistent levels of participation) also point to the need for balance in partnership dynamics. Recommended strategies might include visual consensus activities to develop a shared purpose and greater

alignment of member interests and commitment to the network, creating a meeting minutes template to capture decision-making discussions and highlight actionable items, as well as releasing formal meeting minutes to "smaller partners" (Vandevanter et al., 2011). These findings highlight the need for engaging policymakers in CAPs. While policymakers declined to participate in the study, imputed network ties still indicated their engagement with CAP members. Literature has shown how CBOs with ties to policymakers can facilitate policies to forge collaboration strategies for broader efforts (Honeycutt & Strong, 2012). It is recommended to explore how CBOs with existing ties to policymakers may be engaging them as partners to document best practices for full engagement to the overall CAP infrastructure.

Furthermore, the findings from this project showcase the CAP collaboration process as it responded to environmental fluctuations. This carries important implications for public health leaders, practitioners, and policymakers. With qualitative findings, the study was able to explore external influences from fluctuating environments related to COVID-19 as well as racial injustices across the nation—a context that is largely absent in the CAP literature overall. Instead of dissipating in the face of these challenges, CAP leaders and partners mobilized, responded to community needs, and some partnering agency representatives even took on additional roles to better support their community's needs. It is in hopes that other public health leaders driving partnerships for health equity take this information as guidance and encouragement to navigate future challenges in context.

Importantly, the project contributes to the notion that larger number of partners may not always be the objective of collaborations. Rather, the more important objective may be to focus on the quality of interactions that already exist in CAP networks. Existing connections within established relationships must have a foundation of trust and some shared history to sustain

collaboration efforts. The findings presented here offer details that urge practitioners to keep quality in mind when considering CAP strategies, particularly with the instance of public health emergencies. Trust, values, and a prior history of collaboration or prior relationship with another partner were critical to maintaining ties throughout COVID-19 in this CAP. Although the network decreased in size, the quality maintained and demonstrated strong levels of trust, shared mission, and value of other agencies in the CAP. The study draws attention to these components of relationship-building for more successful collaboration outcomes.

In terms of methodological approaches, the study contributed a practical approach integrating SNA and existing measures on factors that drive partners' motivations (Meza et al., 2016). Overall, there is a need to rethink traditional methods and assessments of relationships with mixed network-based approaches that can highlight positions of influence with partner perspectives and experiences (Varda et al., 2012). Contributions of parallel analysis with qualitative and quantitative components of data enhanced the interpretation of one another to better understand partnership processes. Generally, there is strong potential for community practitioners, leaders and policymakers to make use of the dissertation's methodological approach to identify strengths and areas for growth in CAPs to drive decisions for future collaborations. Conducting ongoing partnership assessments to understand which agencies are working together to address needs and which subgroups have established strong relationships can inform strategies to mobilize partnering agencies for broader impact, enhanced partnership functioning, and stronger group cohesion (Vandevanter et al., 2011).

Concluding Thoughts

Collaborations in public health are complex and can be challenging to manage and apply in practice (Varda et al., 2012; Varda & Sprong, 2020). Taking all the data from this project

together, the nature of CAPs continues to present itself as particularly complex and difficult to understand and implement in communities. However, systems thinking approaches needed to uphold public health equity efforts continually prioritize networks that encourage relationship-building between individuals, organizations, and policymakers extending beyond disciplines, fields, or sectors (Best & Holmes, 2010; Leischow et al., 2008; Leischow & Milstein, 2006). CBOs in collaboratives can influence broader systems change much more than siloed agencies (Roussos & Fawcett, 2000). Overall, CAPs, one form of a collaborative, can lead to broader reach and community impact. This, in turn, serves the potential to promote sustainability of public health interventions within community-based settings generally, and with historically marginalized communities, in particular.

Despite limitations, the project contributes results that inform the understanding of how CAPs collaborate and function with a case example. The network survey demonstrated network ties, positions of partners (in the network), levels of trust, value, and perceived success; the qualitative data then elicited contextual data regarding facilitating and hindering factors to collaboration, pandemic-related impacts to the CAP, and partnership outcomes that can better explain CAP function and activities. Facilitating and hindering factors can inform future collaborative efforts or initiatives geared toward a shared research process between community agencies and academic institutions. Most importantly, incorporating community partner perspectives into CAP strategies can identify priority concerns to better meet community health needs (Brookman-Frazee et al., 2012). Understanding these factors and their influence in the development and processes of CAPs can ensure that collaboration efforts are carried out to their fullest potential to maximize impacts as well as promote sustainability of public health equity outcomes.

APPENDICES

APPENDIX A: Recruitment Materials

Follow-up 1 Email (after phone call)

Dear **Name**,

Thank you again for your willingness to participate in the survey! As discussed, I am sending an email to provide more information on the project, along with a protected survey link designed only for your agency. Please take a minute to review all the details, and let me know if you have any additional questions.
The FCHES Dissemination and Implementation Science Core is conducting a social network analysis to explore the collaboration process among community and academic partners participating in the FCHES Partnership Consortium. You are being asked to participate because you are listed as a key representative for **Agency**. The purpose of this project is to:

- Better understand how partnerships of the consortium are formed and how they are linked to outcomes
- See if there are any things that may make it easier to foster collaboration within the FCHES Partnership Consortium.

The information that you share in this survey will help provide the FCHES Consortium with some guidance as we move forward. Your participation is critical to receiving complete information for proper analysis of the nature and quality of the consortium's relationships.

The project consists of a **10-20 minute survey** followed by **an optional interview**. *You will receive a $15 gift card to Amazon upon completion of the survey and an additional $15 gift card to Amazon for the interview.* Once you begin the survey, you will be able to exit and resume your spot in the survey using the link below.

Please use this link to access the consent form and the survey:

If you have any questions, please contact me right away. You can also contact the research personnel, Tatiana Elisa Bustos at bustosta@msu.edu or the PI, Dr. Amy Drahota at drahotaa@msu.edu.

Thank you very much for your participation and for your work in the Flint community!

Sana Simkani
Intern, Dissemination and Implementation Science Core
Flint Center for Health Equity Solutions
***Michigan State University**, College of Human Medicine*

Direct Line: 810-600-5647
Email: simkanis@msu.edu

Leaving a Message (after phone call)

My name is Sana, and I calling on behalf of The Flint Center for Health Equity Solutions. I'm calling to follow up again on a network survey that was recently sent to you through email. We are hoping to have the surveys completed by Tuesday, January 28 and there will be an option to complete a paper survey at the FCHES Consortium Convening on Thursday, January 30, 2020 from 5 to 7pm. I will be resending you the email with the survey link and more information shortly, but if you have any questions you can either email me back or give me a call back at 810-600-5647. Thank you and have a good day.

Follow up 2 Email

Dear, **NAME**,

My name is Sana, and I am assisting with a sub-project led by the Dissemination and Implementation Science Core at the Flint Center for Health Equity Solutions (FCHES). We are conducting a social network analysis to explore the collaboration process among community and academic partners participating in the FCHES Partnership Consortium. We sent a survey last week to ask you to participate because you are listed as a key representative for **Agency**. The purpose of this project is to:

- Better understand how partnerships of the consortium are formed and how they are linked to outcomes
- See if there are any things that may make it easier to foster collaboration within the FCHES Partnership Consortium.

We are following up on all partners who have not completed the survey yet to gently remind them how important it is to have complete information about the partnership for proper analysis of the consortium's ongoing relationships and collaboration. The information that you share in this survey will help provide the FCHES Consortium with guidance as we move forward toward health equity efforts, in addition to the development of a dissertation.

The project consists of a **10-20 minute survey** followed by **an optional interview**. *You will receive a $15 gift card to Amazon upon completion of the survey and an additional $15 gift card to Amazon for the interview.*

Please use this **link** to access the consent form and the survey:

Once you begin the survey, you will be able to exit and resume your spot in the survey using the link below. Please complete the survey by **Tuesday, January 28** to include your information for the FCHES Consortium Convening on Thursday, January 30, 2020 from 5 to 7pm. You will also have the opportunity to complete the paper version of the survey at the convening.

If you have any questions, please contact me right away. You can also contact the research personnel, Tatiana Elisa Bustos at bustosta@msu.edu or the PI, Dr. Amy Drahota at drahotaa@msu.edu.

Thank you very much for your participation and for your work in the Flint community!

Sincerely,

Sana Simkani
Intern, Dissemination and Implementation Science Core
Flint Center for Health Equity Solutions
***Michigan State University**, College of Human Medicine*

Direct Line: 810-600-5647
Email: simkanis@msu.edu

Follow up 3- Final Email Distributed

Dear**, Name**,

My name is Sana, and I am assisting with a sub-project led by the Dissemination and Implementation Science Core at the Flint Center for Health Equity Solutions (FCHES).

You are being asked to complete a network survey because you are listed as a key representative with the most knowledgeable input for the **Agency** . The network survey will be used to conduct a social network analysis that explores the collaboration process among community and academic partners participating in the FCHES Partnership Consortium.

We are sending a final reminder to all remaining partners who have yet to complete the network survey. Please understand that it is important to have complete information about the partnership for a proper social network analysis. The information that you share in this survey will help provide the FCHES Consortium with guidance as we move forward toward health equity efforts, in addition to the development of a dissertation.

The survey will only take about **10 minutes to complete**, followed by **an optional interview**. *You will receive a $15 gift card to Amazon upon completion of the survey and an additional $15 gift card to Amazon for the interview.*

Please use this **link** to access the consent form and the survey:

We ask that you please complete this by Feb 7 or at your earliest convenience.

We sincerely appreciate your time and value your input on how we can improve health equity promotion efforts as a partnership.

If you have any questions or concerns, please contact the lead researcher, Tatiana Elisa Bustos (Ph.D. Candidate) at bustosta@msu.edu or 786 4498795.

Thank you,

Sana Simkani
Intern, Dissemination and Implementation Science Core
Flint Center for Health Equity Solutions
***Michigan State University**, College of Human Medicine*

APPENDIX B: Adapted PARTNER Tool Survey

Table 33.

Adapted PARTNER Tool Survey

Q#	Question Text	Question Response Options	Modifications
1	**Your organization should be listed below. If it is not, please return to the original email and click on that link.**		
2	**What is your job title?**	[open-ended]	
3	**What was your motivation for joining the FCHES Partnership Consortium?**	The idea of collaborating with other community agencies fits with my agency's/program's philosophy Opportunity for networking with other community providers Opportunity for future training/ consultation Number of studies my agency/program is asked to participate in Experiences with other FCHES members Reputation of FCHES and/or the research team in the community Need for a systematic process for adopting and using new evidence-based practices Pressure to implement new evidence-based practices Participation in other research studies Fiscal implications of participation in a collaborative group Time implications of participation in a collaborative group Alignment of collaborative principles with agency/program policies Administrative support for collaboration in order to develop a systematic process for adopting and using evidence-based practices Need for adopting and using new evidence-based practices. Opportunity to use the systematic process that is developed to help adopt and use new evidence-based practices within my agency	Decision to participate survey (15 item)

Table 33. (cont'd)

4	**How long have you been involved with the FCHES Consortium Core (in months)?** Please type 0 if no interaction with the network, 24 for two years, etc. Note: type numerals	[open-ended]	**numerical value as a response**
5	**Please indicate what your organization contributes, or can potentially contribute, to the FCHES Partnership Consortium (choose as many as apply).**	Funding In-Kind Resources (e.g., meeting space) Paid Staff Volunteers and Volunteer staff Data Resources including data sets, collection and analysis Info/ Feedback Specific Health Expertise Expertise Other Than in Health Community Connections Fiscal Management (e.g. acting as fiscal agent) Facilitation/Leadership Advocacy IT/web resources (e.g. server space, web site development, social media) Other (text box)	The response options listed here are from the default survey.
6	**What is your organization's most important contribution to the FCHES Partnership Consortium?**	Same response list as #4	
7	**Outcomes of the FCHES Partnership Consortium's work include (or could potentially include): (choose all that apply).**	Health education services, health literacy, educational resources Improved services Reduction of health disparities Improved resource sharing Increased knowledge sharing New sources of data Community support Public awareness Policy, law and/or regulation Improved health outcomes Improved communication	
8	**In your opinion, which is the FCHES Partnership Consortium's most important outcome?**	Same response list as #6	Whatever responses someone chooses in Q 6 will populate as possible responses for Q7.
9	**Collectively, how successful has the FCHES Partnership Consortium been at reaching its goals?**	Not Successful Somewhat Successful Successful Very Successful Completely Successful	

Table 33. (cont'd)

10	**What aspects of collaboration have contributed to this success? (choose all that apply)**	Respect among partners Good relationships between partners Positive community impact Trust between partners Mutual benefit for all partners Clearly differentiated roles/functions of partners Shared vision, goals, and/or mission Well-structured meetings Good initial selection of partners Effective and/or frequent communication Effective conflict resolution Good quality of leadership Bringing together diverse stakeholders Exchanging info/knowledge Sharing resources Informal relationships created Other (write-in response)	
11	**What aspects of collaboration have made partnership efforts more difficult? (choose all that apply)**	Mistrust between partners Poor or unequal decision-making Lack of mutual benefit Unclear roles and/or functions of partners Excessive time commitment High burden of activities/tasks Differing expectations of partners Inconsistent partner participation or membership Excessive funding pressures or funding control struggles Poor communication between partners Lack of shared vision, goals, and/or mission Lack of a common knowledge or shared terms between partners Something else [text box] None of these	Applied barriers from Drahota et al.'s (2016) systematic review
12	**From the list, select <u>organizations</u> with which you have an established relationship (either formal or informal). In subsequent questions you will be asked about your relationships with these <u>organizations</u> in the context of the FCHES Partnership Consortium.** NOTE: Your organization is not listed below because you are representing the organization in the survey you are taking now and cannot choose your own		**List of organizations to choose from will be based on the respondent list uploaded.**

Table 33. (cont'd)

	organization as a partner to answer questions about.		
13	**How frequently does your <u>organization</u> work with this <u>organization</u> on issues related to the FCHES Partnership Consortium's goals?**	Never/We only interact on issues unrelated to the collaborative Once a year or less About once a quarter About once a month Every week Every day	
14	**Please describe the nature of your relationship with this <u>organization</u> [note: the responses increase in level of collaboration]?**	None Awareness of what this org/program/dept's role in the system (e.g. understanding of services offered, resources available, mission/goals) Cooperative Activities: involves exchanging information, attending meetings together, informing other programs of available services Coordinated Activities: Includes cooperative activities in addition to exchange of resources/service delivery; coordinated planning to implement things such as Client Referrals, Data Sharing, Training Together Integrated Activities: In addition to cooperative and coordinated activities, this includes shared funding, joint program development, combined services, shared accountability, and or shared decision making	
15	**How valuable is this organization's POWER and INFLUENCE to achieving the overall mission of the FCHES Partnership Consortium? *Power/Influence: The organization/program/department holds a prominent position in the community by being powerful, having influence, success as a change agent, and showing leadership.**	Not at all A small amount A fair amount A great deal	Questions 15-19 are based on validated scales to measure perceived value and trust among partners, so they generally need to remain as is, although we can customize for your network. Please do not modify the response options as it is linked to the analysis tool/ calculations.

Table 33. (cont'd)

16	**What is this organization's level of involvement in the FCHES Partnership Consortium?** ***Level of Involvement: The organization/program/department is strongly committed and active in the partnership and gets things done.**	**1.** Not at all **2.** A small amount **3.** A fair amount **4.** A great deal	
17	**To what extent does this organization contribute resources to the FCHES Partnership Consortium?** ***Contributing Resources: The organization/program/department brings resources to the partnership like funding, information, or other resources.**	**1.** Not at all **2.** A small amount **3.** A fair amount **4.** A great deal	
18	**To what extent does the organization share a mission with the FCHES Partnership Consortium mission and goals?** ***Mission Congruence: this organization/program/department shares a common vision of the end goal of what working together should accomplish.**	**1.** Not at all **2.** A small amount **3.** A fair amount **4.** A great deal	
19	**How open to discussion is the organization?** ***Open to Discussion: this organization/program/department is willing to engage in frank, open and civil discussion (especially when disagreement exists). The organization/program/department is willing to consider a variety of viewpoints and talk together (rather than at each other). You are able to communicate with this organization/program/department in an open, trusting manner.**	**1.** Not at all **2.** A small amount **3.** A fair amount **4.** A great deal	
20	**In your opinion, what resources or actions are needed to improve FCHES Consortium Partnership?**	[open-ended]	This item is collecting info on areas for improvement/needs of the collaboration
21	**In your opinion, what are the strengths of the FCHES Consortium?**	[open-ended]	This item is collecting info on strengths of the collaboration

Table 33. (cont'd)

22	**Do you have any questions or comments?**	[open-ended]	

APPENDIX C: Semi-Structured Interview Protocol (Partners)

Participant ID#_____ Interview Date: _____

FCHES Partner Interview

Interviewer Script:

Thank you for taking the time to talk to me about your experiences as a (community or academic) partner in the FCHES PCC. This interview will be less than one hour. Please remember that there is no wrong answer to these questions. We are really interested in hearing more about how you feel about your own experiences in a community academic partnership.

Please remember that you do not have to respond to anything that makes you feel uncomfortable. Zoom will be recording this conversation to maintain a record of what was shared with me. However, I will make sure to keep any names or other identifiable information confidential. MSU Zoom is HIPPA compliant and will assure privacy of our conversation. After the recording is reviewed, it will be destroyed.

Before we begin, I want to tell you a little bit about the project. The purpose of this dissertation is to better understand the experiences of partners in CAPs. Specifically, we want to learn more about: (a) your perspectives on the collaboration process with the FCHES PCC, (b) barriers and facilitators to the PCC CAP efforts, (c) your motivations for joining the CAP, and (d) expectations of PCC outcomes. At the end of the interview, we welcome any suggestions you might have to improve the partner for future efforts.

Do you have any questions before we begin?

(Begin recording on Zoom)

In the first section of questions, we want to ask about your role as a partner in the FCHES PCC and your motivations for joining.

1. How did you get involved with the PC?
    Prompt: Did someone recruit you? Were you invited by a staff member to participate?
2. Please describe your role as a partner in the PC. What do you do as a partner?
    Prompt: Do you attend meetings? Involved in making any decisions? Work with other partners?
3. You noted FACTOR as your motivation to join the PC. Please tell me more about why FACTOR motivated you to join the partnership.
    Probe: Which of these factors is most important for your ongoing involvement with PC? What are other reasons you *continue* to serve as a partner?
    Probe: What is it that keeps you involved in the collaboration? Why do you continue to attend?

4. (**If a community partner)** What do you hope to get from the academic partners?
(If an academic partner) What do you hope to get from community stakeholders?

Probe (Both): What do you think other community/academic partners hope to gain from the PC?

Probe: How does your organization benefit from you being on the PC? **

The next set of questions will ask you about the characteristics of the FCHES PC, specifically. We will talk about roles, decision-making processes, resources, and so on. Some of this will build on your responses from the social network survey we sent earlier in January.

Throughout this section we will be referring to the PC as a CAP,
CAPs refer to ... "partnerships characterized by equitable control, a cause(s) that is primarily relevant to the community of interest, and specific aims to achieve a goal(s), and involves community members (representatives or agencies) that have knowledge of the cause, as well as academic researchers" (Drahota et al., 2016a, op. 192).

5. On the network survey, you identified (QUANT) as facilitators in the CAP. Could you elaborate on that/those?

Prompt: Which of these do you think are **most important** to sustain a CAP?

6. On the network survey, you identified (QUANT) as hindering factors to the CAP. Could you elaborate on that/those? Do you feel that is/they are ongoing or resolved?

Prompt if ongoing: Do you have any ideas or suggestions on how that could be improved in the future for CAPs?

Prompt if resolved: Do you have any ideas or suggestions on how future collaborations could avoid a similar issue?

7. In closing, what is the role, in general, of the FCHES PC as a community academic partnership?

Probe: What is the mission of this CAP?

Prompt: What kind of challenges has the CAP faced in carrying out this role, if any? What kind of challenges do you expect in the future, if any?

Is there anything else you'd like to share that I haven't asked about?

Thank you so much for telling us more about your partnership experiences. This is the end of our interview.

STOP RECORDING

Materials adapted from (Gomez et al., 2018a; Ortega et al., 2018)

APPENDIX D: CAP Leaders Interview Protocol

Participant ID#_____ Interview Date: _____

Interviewer Script:

Thank you for taking the time to talk to me about the FCHES Partnership Consortium. We're interested in learning more about the FCHES Partnership Core's leadership structure, decision-making processes, and any changes that may have occurred in response to COVID-19 and community partners' needs.

This interview will take up to 30 minutes. Please remember that there is no wrong answer to any of these questions. You do not have to respond to anything that makes you feel uncomfortable; although, we don't expect that any of these questions would. Zoom will be recording this conversation to maintain a record of what was shared. However, we'll make sure to keep any names or other identifiable information confidential. MSU Zoom is HIPPA compliant and will assure privacy of our conversation. After the recording is reviewed and the data is transcribed, it will be destroyed. Please let me know if there's any other information you would want removed from the final transcripts at the end of this interview.

At the end of the interview, we welcome any suggestions you might have to improve CAP efforts or other comments. Do you have any other questions before we begin?

(Begin recording on Zoom)

1. Please tell me about the leadership structure of the CAP.

[*If participant is unsure how to answer, prompt the following*] Please tell me more about the leadership or communication procedures, governance structures.

2. Please describe the decision-making processes that drive the CAP. Please tell me how a decision would get made in the CAP.
[If participant doesn't know how to answer]: How would you describe the power distributed among community and academic partners in the decision-making process?

Probe: What role do community partners play in decision-making processes?
Probe: What role do academic partners play in decision-making processes?

3. Have there been any changes made to the CAP or its efforts as a result of COVID 19?

[If participant answered yes] **Please tell me more about the changes that have occurred in response to the COVID-19 pandemic.**

Interviewer: Please ask each of the following prompts below. Make sure that the participant addresses at least one factor in each of the 3 processes below (e.g., interpersonal, perceptual, and operational processes)]

[Interpersonal processes probe] How has this impacted the interpersonal processes (such as establishing relationships, establishing trust, clarity of roles, clarity of responsibilities, shared goals)
[Perceptual processes probe] How do you think this has impacted partners' motivation or perception of the FCHES Partnership Consortium?
[Operational processes probe] How do you think this has impacted the infrastructure, administrative support, leadership, or communication?

4. If another health-related CAP was facing a public health crisis in the future, what is one thing you would you say or recommend to their leaders to maintain partnership efforts?

5. Is there anything else you would like to add that I may have missed in this interview?

Thank you so much for your time and for sharing your perspective!

APPENDIX E: Measures for Overall Power/Influence, Involvement, and Contributions

Table 34.

Measures for Overall Power/Influence, Involvement, and Contributions

		Partners' Power/Influence		Level of Involvement		Resource Contributions	
Partner Type	**Partner**	**T1**	**T2**	**T1**	**T2**	**T1**	**T2**
Community	AMC	3.00	2.50	2.00	1.50	2	2
Community	AVE	4.00	4.00	3.00	4	3	3
Community	BBF	3.00	4.00	2.50	4	2.5	3.50
Community	CBOP	3.38	3.11	3.63	3.44	3.38	3.00
Academic	METHOD	0	3.33	0	3.67	0	2.83
Community	COFY	2.5	2.75	3.00	3.00	2.5	2.75
Academic	PCC	3.8	3.33	3.50	3.89	3.1	3.56
Community	FOHI	3.11	2.70	3.38	3.44	2.89	2.44
Community	GCBH	2.5	3.25	2.83	3.50	2.4	2.50
Community	GCHD	3.18	3.55	3.09	3.55	2.55	3.36
Community	GHP	3.31	3.64	3.62	3.64	3	3.36
Community	GHS	3.11	3.63	3.00	3.25	2.89	2.88
Community	GFHC	3.38	3.50	3.25	3.50	3.13	3.33
Community	HCHN	3.08	3.60	2.58	3.50	2.5	3.00
Community	LP	2	3.00	2.00	4.00	2	4.00
Community	LUFF	2.4	2.67	2.20	3.00	2.4	2.67
Community	MCHWA	3	2.50	2.25	2.50	2.25	2.33
Community	MPHI	3.14	3.14	2.43	3.14	2.29	2.57
Community	NAACP	3.33	2.00	2.67	3.00	3	1.00
Community	NCAAHC	3.5	3.50	2.75	4.00	3.25	4.00
Community	NCHE	2.5	2	2.5	3.00	2.5	1.75
Community	PIHP	3.2	3.25	3	2.50	3	3.25
Policymaker	DK	2.63	3.40	1.75	3.60	1.63	2.60
Policymaker	SN	2.33	3.60	1.78	2.60	1.89	2.40
Academic	UM	3.44	3.00	3.33	2.75	2.89	2.63
Academic	UMF	3.36	3.00	3.18	3.18	3	3.18
Community	WellAIDS	3.33	2.67	2.83	2.83	2.33	2.40

APPENDIX F: Spearman's Rho Correlations for T1 and T2

Table 35.

Spearman's Rho Correlations for T1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Partner Type	1.000	0.156	0.136	0.076	0.076	-0.175	.410*	0.084	0.187	-0.292	-.428*	-0.212	-0.076	-0.182	-0.045	-0.106
2. Perceived Success	0.156	1.000	-0.060	0.016	0.143	-0.186	0.008	-0.087	.509*	0.326	0.160	0.044	0.063	0.232	0.344	0.251
3. Degree	0.136	-0.060	1.000	-0.057	0.272	.420*	.629**	.879**	0.149	0.310	.626**	.537**	.639**	.570**	0.372	0.370
4. Cluster	0.076	0.016	-0.057	1.000	-0.361	0.097	-0.293	-0.228	0.029	-0.331	-0.088	-0.044	0.022	0.129	-0.131	-0.111
5. Betweenness	0.076	0.143	0.272	-0.361	1.000	0.317	0.385	.578**	-0.049	.441*	0.201	0.254	0.254	0.300	.470*	.472*
6. In degree	-0.175	-0.186	.420*	0.097	0.317	1.000	-0.104	.464*	-0.174	0.188	.455*	0.354	.411*	.686**	0.280	0.209
7. Out degree	.410*	0.008	.629**	-0.293	0.385	-0.104	1.000	.671**	0.155	0.080	0.085	0.165	0.216	0.100	0.105	0.213
8. Closeness	0.084	-0.087	.879**	-0.228	.578**	.464*	.671**	1.000	0.066	0.306	.507*	.481*	.500*	.488*	0.363	0.352
9. Goals	0.187	.509*	0.149	0.029	-0.049	-0.174	0.155	0.066	1.000	0.108	0.135	-0.002	0.126	0.146	0.154	0.026
10. Trust	-0.292	0.326	0.310	-0.331	.441*	0.188	0.080	0.306	0.108	1.000	.649**	.555**	.650**	.558**	.968**	.936**
11. Value	-.428*	0.160	.626**	-0.088	0.201	.455*	0.085	.507*	0.135	.649**	1.000	.894**	.901**	.881**	.647**	.576**
12. Power/Influence	-0.212	0.044	.537**	-0.044	0.254	0.354	0.165	.481*	-0.002	.555**	.894**	1.000	.804**	.688**	.579**	.606**
13. Resource Contributions	-0.076	0.063	.639**	0.022	0.254	.411*	0.216	.500*	0.126	.650**	.901**	.804**	1.000	.788**	.699**	.606**
14. Involvement	-0.182	0.232	.570**	0.129	0.300	.686**	0.100	.488*	0.146	.558**	.881**	.688**	.788**	1.000	.630**	.507**
15. Mission	-0.045	0.344	0.372	-0.131	.470*	0.280	0.105	0.363	0.154	.968**	.647**	.579**	.699**	.630**	1.000	.861**
16. Discussion	-0.106	0.251	0.370	-0.111	.472*	0.209	0.213	0.352	0.026	.936**	.576**	.606**	.606**	.507**	.861**	1.000

Table 36.

Spearman's Rho Correlations for T2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Partner Type	1	-0.239	-0.136	-0.076	-0.139	-0.289	0.062	-0.159	-0.207	0.030	-0.076	-0.015	-0.136	-0.061	0.023	0.137
2. Perceived Success	-0.239	1.000	.498*	0.377	-0.103	0.241	0.370	0.369	0.130	0.094	0.394	0.310	0.266	0.430	0.370	0.026
3. Degree	-0.136	.498*	1.000	-0.113	.610**	.735**	.792**	.965**	0.377	0.009	0.361	.398*	.432*	0.212	0.123	0.047
4. Cluster	-0.076	0.377	-0.113	1.000	-.484*	0.001	-0.382	-0.201	0.001	0.015	0.085	-0.073	0.087	0.132	0.153	0.102
5. Betweenness	-0.139	-0.103	.610**	-.484*	1.000	.430*	.701**	.712**	0.188	-0.019	0.042	0.122	0.016	-0.018	-0.062	-0.054
6. In degree	-0.289	0.241	.735**	0.001	.430*	1.000	0.365	.751**	0.285	-0.148	0.116	0.249	0.180	0.010	0.008	-0.115
7. Out degree	0.062	0.370	.792**	-0.382	.701**	0.365	1.000	.803**	0.396	-0.001	0.260	0.298	0.362	0.100	0.018	0.052
8. Closeness	-0.159	0.369	.965**	-0.201	.712**	.751**	.803**	1.000	0.371	-0.038	0.315	0.368	0.367	0.204	0.099	-0.039
9. Goals	-0.207	0.130	0.377	0.001	0.188	0.285	0.396	0.371	1.000	-0.050	0.182	0.002	0.338	0.111	0.075	-0.252
10. Trust	0.030	0.094	0.009	0.015	-0.019	-0.148	-0.001	-0.038	-0.050	1.000	.702**	.518**	.610**	.698**	.826**	.882**
11. Value	-0.076	0.394	0.361	0.085	0.042	0.116	0.260	0.315	0.182	.702**	1.000	.864**	.910**	.915**	.804**	.617**
12. Power/Influence	-0.015	0.310	.398*	-0.073	0.122	0.249	0.298	0.368	0.002	.518**	.864**	1.000	.725**	.724**	.585**	.443*
13. Resource Contributions	-0.136	0.266	.432*	0.087	0.016	0.180	0.362	0.367	0.338	.610**	.910**	.725**	1.000	.727**	.687**	.556**
14. Involvement	-0.061	0.430	0.212	0.132	-0.018	0.010	0.100	0.204	0.111	.698**	.915**	.724**	.727**	1.000	.810**	.607**
15. Mission	0.023	0.370	0.123	0.153	-0.062	0.008	0.018	0.099	0.075	.826**	.804**	.585**	.687**	.810**	1.000	.734**
16. Discussion	0.137	0.026	0.047	0.102	-0.054	-0.115	0.052	-0.039	-0.252	.882**	.617**	.443*	.556**	.607**	.734**	1.000

APPENDIX G: CAP Leaders Interview Codebook

Table 37.

Codebook with Frequencies (Source, Ever Coded) for CAP Leader Interviews

Theme	Category	Subcategory	Description	# Sources, Times
Formation of the Collaborative Process	**Operational Processes**	Leadership Structure	Includes comments related to leadership or governance structure and key leaders or administrative support driving the CAP's efforts in health equity	**3, 8**
		Communication Structure	Includes comments regarding communication systems or administrative support in place to share information across leaders and outside to partnering CBOs or other key stakeholders	**2, 11**
		Decision-making Approaches	Includes details that describe how decisions are made in the CAP, along with specific responses about community and academic partners' roles in carrying out decisions	**3, 19**
Community Context	**Changes from COVID-19**	Operational Processes	Any details describing how the pandemic had impacted leadership structure, administration, or communication structures.	**2, 2**
		Interpersonal Processes	Includes details describing how the pandemic impacted relationships, relationship-building strategies, trust, roles, responsibilities, and/or shared goals	**2, 8**
		A. Strategies to maintain relationships		**3, 23**
		B. External Impact on Relationships		**3, 11**
		C. Clarifying Roles		**2, 2**
		Perceptual Processes	Responses include details about how the pandemic impacted motivating factors to participate with the CAP along with any perception of the CAP's success. Examples include motivations, perceived goals, or other individual perceptions that mediate one's involvement in a partnership	**3, 20**
		Other external Impacts	Other impacts related to external contexts that played any role in maintaining the CAP collaborations	**3, 8**

APPENDIX H: Codebook for Partner Interviews: Facilitating Factors, Hindering Factors and Motivations

Table 38.

Codebook for Partner Interviews: Facilitating Factors, Hindering Factors, and Motivations

	Theme	Codes	Description	# Sources, Times
Facilitating Factors	**1. Facilitating factors specific to the CAP**	Facilitators	This code captures details that describe factors that make the collaboration easier to manage or navigate.	56, 9
	2. Facilitating factors for broader public health equity collaborations	*A. Relationship Among Partners*		24, 9
	3. Facilitating factors from external influences	*B. Influence of External Factors*		22, 9
Hindering Factors	**1. Hindering factors specific to the CAP**	Hindering factors	This captures details that describe factors that make the collaboration easier to manage or navigate.	129, 9
	2. Hindering factors for broader public health equity collaborations	*A. Influence of external factors*		30, 9
	3. Hindering factors from external influences			
Motivations	**1. Community and Academic Partner Motivations**	Motivations	Individual level drivers that motivated the participant to participate with the CAP and/or continue to participate with the CAP over time. Examples of motivations can include having a shared mission or value; having an organization or other existing efforts that are already in that health equity space	76, 9

APPENDIX I: Dissertation Revisions Addendum

Amendments to the Data Collection Procedures

Method Section:

RQ1. What factors facilitate or hinder the development of CAPs over time?

- To answer this RQ, I will use data from factors reported as facilitators and barriers on the CAP survey item at T1 and T2, and in the qualitative interviews completed at T2. Of note, I have already collected quantitative data on facilitators and barriers to CAPs for T1.
- Descriptive analyses will summarize frequencies of quantitative responses at T1 and at T2.
- Additionally, I will analyze interview data at T2 using content analyses.
- Mixed methods analysis will then integrate both the QUAN and qual data using a joint display.
- Please note that qualitative interviews at T1 will not be completed due to the current priorities of community partners presenting as barriers to recruitment. However, I have modified my proposal to include interviews with the CAP leaders (2 academic Co-PIs and 1 community PI) at 6 months post-CAP formation in order to gather data on decision-making processes and any changes made to the CAP purpose or structure due to the COVID pandemic (see Figure 1).

RQ2. How do network outcomes change from T1 to T2?

- I plan to utilize the following data to answer RQ2: network density, degree centrality, level of involvement, in degree centrality, out degree centrality, mean degree, value, power/influence, resource contribution, trust, mission congruence, open to discussion, frequency of ties, level of collaboration.
- T1 data has already been gathered (but has not yet been analyzed) through the administration of the PARTNER Tool. This survey will be administered at T2.
- Change in frequency of ties and level of collaboration of all partners will be calculated by comparing mean frequencies between the two timepoints. The point change between the two time periods will provide growth scores in level of collaboration as well as the frequency of ties. This procedure follows recommendations from Bright CF, Haynes EE, Patterson D, Pisu M (2017) The value of social network analysis for evaluating academic-community partnerships and collaborations for social determinants of health research. Ethn Dis. https://doi.org/10.18865/ed.27.S1.337
- To assess changes over time for other network measures, I plan to use exploratory analyses (e.g., mean comparisons, frequencies) to determine any observed changes over the one-year study timeframe. Differences in ties by partner type will also be illustrated in the sociometric circle (e.g., academic partners have green nodes, community partners have yellow nodes) in order to facilitate evaluation of these data.
- Moreover, I plan to use Wilcoxon Signed Ranks test with effect size calculations to determine any significant changes in an agency's value, power/influence, resource contribution, trust, mission congruence, and openness to discussion by time-point and by partner type (community, academic).

RQ3. How does perceived success from timepoint 1 differ from timepoint 2?

- To answer this, data has been collected related to "Perceived CAP Success" at T1 from 24 CAP partners, and this data will be collected at T2.
- I will analyze "Perceived Success" with Mann Whitney U Test with effect size calculations to compare scores between academic and community partners.
- This same procedure will be used to explore differences by timepoints.
- **RQ3-*B.*** *How do SNA measures and organizational characteristics ("trust" and "value") relate to partners' perception of CAP success at T1 and at T2*?
    - Please note that RQ3-B was previously an independent research question ("How do organizational level characteristics relate to partners' perception of CAP success at T1 and T2?") but in consultation with my dissertation advisor, I have made it a subquestion to RQ3 because they are highly related.
    - To answer this RQ, I plan to analyze the node level measures, "Total Trust," "Total Value," and "Perceived Success" for each partner using the PARTNER Tool SNA.
    - Descriptive statistics (e.g., means, SDs, frequencies) will be used to summarize variables at T1 and T2.
    - Spearman rank order correlation analysis will be used to analyze the correlation between variables.

RQ4. What are the partners' motivating factors to engage with the CAP at T1 and T2?

- I plan to analyze nominal data from the DPQ survey item identifying motivating factors to join the CAP at both T1 and T2. I have already collected this data for T1.
- Responses from T1 and T2 will be analyzed using multiple response frequencies; further, interview data at T2 will ask participants to discuss their T2 survey responses in more detail.
- Interview data will be analyzed using content analysis.
- **RQ4-*B***. *How have motivating factors changed across time-points?*
    - Frequencies from the DPQ survey responses on motivating factors will be used to compare T1 and T2 responses by partner type (academic vs. community).
    - Nominal variables for motivational factors will be transformed to count variables. For example, if a participant selected 2 factors for motivation, they would receive a 2 for number of motivational factors ("NUMMotivation"). Mann Whitney U Test with effect size calculations will be used to compare scores between academic and community partners and differences in timepoints.

Exploratory RQ5. How does the formative collaborative process (e.g., interpersonal, operational, perceptual) lead to proximal outcomes (e.g., partnership synergy, intermediate goal attainment, and creation of tangible products)?

- While this research question cannot be answered with quantitative statistical analyses, components will be described by phase (formation, execution, sustainment) of the research community partnership model to present a descriptive case.
- Descriptive details will be provided to summarize frequencies, counts of tangible products, number of partners attending convenings, and SNA measures collected from the PARTNER Tool.
- Please note that this question has been designated as an exploratory research question because it does not directly address the aforementioned gaps in the literature.

Participants for QUAN Phase

- I have collected quantitative data for the social network analysis at T1, but have not analyzed any data. I attempted to survey all 28 CAP partners for T1. However, the final data for T1 has 23 responses, including: 3 academic partners, 17 local partners, and 3 national partners. Participants who did not complete the T1 network survey included 2 policymakers, 1 academic partner, and 2 local partners.
- For T2, I will attempt to survey all 28 CAP partners for the quantitative survey.
- Please note that obtaining data from the policymaker partners has been difficult. At T2, I will make every effort to recruit the policymaker partners to participate in the study by working with the CAP Co-PI to help facilitate access. I will note these efforts in the final document. If data cannot be obtained from policymakers at all, I will remove them from the participant sample, but still report them in the sociometric network to depict existing connections reported from other partners. For example, partner A, B, and C may report collaborations with policymaker A, allowing for the calculation of an undirected tie in the network.
- Of additional note, CAP partners have been and will continue to be recruited based on their role in the CAP, meaning that the CAP representative from the partnering organization will be asked to complete the survey and interviews. I will not require the same *individual* to participate at both T1 and T2, but rather the person who is the organization's CAP partner at the time of data collection.

QUAN Data Analysis Procedures

- As indicated above, every effort to get a key representative to complete the survey will be made at T2, including phone calls, emails, and paper surveys.
    - If a participant does not complete the survey, some network ties can be replaced using undirected ties reported from other agencies in the network to indicate that a relationship exists.
    - For subscales with 75% or more of items completed, mean subscale substitution will be used to handle missing data, any subscale with less than 75% completed will count as missing data ("9999").
    - If demographic data is missing (e.g., job title at the agency, duration of time involved with FCHES, etc.), I will generate information from archival records and discussions with the CAP leadership.
- I have already collected data for the quantitative phase at T1. Social network analysis (SNA) does not yield typical psychometric output commonly seen in statistical analyses. Rather, SNA yields descriptive data related to the structure and relationships of partners within the network, including mean degree, centrality measures (in/out centrality), and geodesics. This data will be analyzed once the dissertation proposal has been approved.
- Additionally, prior to the T2 QUAN data collection, I plan to add survey items to the PARTNER Tool related to the COVID pandemic.
    - Ethnographic observations and memos that have been (and will continue to be) gathered from T1 to T2 will be used to guide the design of these new survey items. Examples of possible item topics include coordinated FCHES trainings or education on COVID-19, dissemination of health information, etc.

qual Data Collection Procedures

- **I will not be attempting to obtain interview data with partners for T1 qual data** because community partners have explicitly stated that they have more important priorities to respond to its community, making recruitment particularly burdensome and challenging at this time.
- However, I plan to interview the 3 CAP directors in order to collect information on the mission, leadership structure, and any CAP changes in response to partner's existing needs.
- Additionally, modifications to interview questions will be made to incorporate the effects of COVID-19 on the partnership process. For T1, interview questions with directors (1 community PI and 2 academic co-PIs) will include an item exploring how the CAP may have changed due to COVID 19 and what role partners played in supporting their health equity efforts. Examples of questions will include: How has the partnership changed and how did they adapt to support agencies' health equity efforts?
- For T2 qualitative data collection, I will make every attempt to interview all participating partners in the CAP as listed in the network roster at T1, with efforts to interview each partner type (academic, community, policymaker). Specifically, I will sample participants from the CAP network using a purposeful sampling/recruitment strategy that aims to recruit at least 50% of the partners from each of the partnership categories (e.g., 50% or more of academic partners, 50% or more of local CBO partners, 50% or more of national CBO partners, and 50% or more of policymakers).
- Qualitative data saturation will be determined at the data collection stage and achieved with the following procedure: Once interviews have been completed and transcribed, two coders will code interview data to identify patterns and emergent themes. If data collected in the interviews begin to show redundancy, then it is expected that data saturation has been reached. If the two coders agree that the comments in the interview data are showing repetition, then data saturation is being reached. A final consensus meeting will determine the decision about whether any "new information" is being generated and to determine the degree to which identified codes or themes are represented in the data that has already been collected. These procedures follow guidance from Saunders, B., Sim, J., Kingstone, T., Baker, S., Waterfield, J., Bartlam, B., Burroughs, H., & Jinks, C. (2018). Saturation in qualitative research: exploring its conceptualization and operationalization. *Quality & quantity*, *52*(4), 1893–1907.

Proposed Contributions to the Gaps in the Literature

GAP 1: Limited literature on the experiences of community stakeholders' participation in CAPs.

- QUAN data collected at timepoint 1 (T1) will provide data related to community stakeholders' CAP participation.
- Further, I propose to collect qualitative interview data at T2 on the facilitators and barriers, CAP process, motivations, and perceived outcomes from the perspective of partners, adapting a prior interview protocol that elicited details on experiences of community partners (Ortega et al., 2018).
- I will integrate T2 interview data with T2 quantitative data on facilitators/barriers of CAP participation.

✓ ***Taken together, this data will contribute to literature on experiences of community partners in CAPs.***

GAP 2: Lack of knowledge on relationship ties exchanged between partners in CAPs (from a social network perspective).

I have calculated percentages on network-level variables using the PARTNER Tool SNA platform. The same procedures will be followed for T2. Network-level variables include:

- Network density (% of all ties possible ties in the network)
- Value (%)
- Power/influence (%)
- Level of involvement (%)
- Resource contribution (%)
- Trust (%)
- Mission congruence (%)
- Open to discussion (%)

Additionally, I have calculated node-level measures (for each individual agency) using the PARTNER Tool SNA. The same procedures will be followed for T2. Node-level measures include:

- Degree centrality
- In degree centrality (Range 0-27)
- Out degree centrality (Range 0-27)
- Total Value (Likert scale 1-4; higher scores indicate higher value)
- Power/influence (1-4; higher scores indicate higher influence)
- Level of involvement (1-4; higher scores indicate higher involvement)
- Resource contribution (1-4; higher scores indicate higher contributions)
- Total Trust (1-4; higher scores indicate higher trust)
- Mission congruence (1-4; higher scores indicate higher congruence)
- Open to discussion (1-4; higher scores indicate more openness)
- Quality of ties (Likert scale 1-6; higher scores indicate higher level of collaboration) between pairs of partners depicted in sociometric network

✓ ***This social network data will contribute knowledge on network structure and relationship ties exchanged between partners in CAPs at over time. This may provide evidence to support the assertion that CAPs improve social networks and collaboration between those involved in the partnership.***

GAP 3: Community partners' motivation and perception of CAP success is understudied.

✓ ***I will identify motivating factors from the DPQ survey item to contribute to the literature on factors motivating community and academic partners to participate in a CAP at the formation phase and over a one year-period.***

✓ ***QUAN data on "perceived success" from the PARTNER Tool item will contribute knowledge on perceived CAP success from partners at the formation phase and over a one-year period.***

✓ ***Qualitative interviews at T2 will expand on QUAN findings related to community partners' motivation and perceived CAP success.***

GAP 4: Mechanisms of change in CAPs

✓ ***The proposed project does not directly contribute data to fill this gap but provides implications for processes that might explain changes that occur in a CAP throughout a year period.***

GAP 5: The influence of external factors in fluctuating environments have been understudied within CAPs.

- To account for the context of COVID-19, ethnographic observations will be used to document ongoing efforts of the CAP to respond to partner needs. Examples of these observations include description of webinars, documenting email communication efforts disseminating health information, documenting efforts to schedule individual meetings with community partners, or other additional support exchanged between community and academic partners. Ongoing meetings with the Co-PI will be used to broadly discuss updates on how the CAP plans to support its partners.
- I will conduct qualitative interviews at T1 (June) with the PI, Co-PI and community PI to elicit details on the CAP's mission, leadership structure, and any changes that may have influenced leadership decisions to redirect the CAP or what may have been modified in the CAP activities.

✓ ***Findings from qualitative interviews and ethnographic observations will contribute to the literature on how CAPs may function in response to the fluctuating environment from a health equity crisis.***

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